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WHAT IS THE MATTER WITH STEEL?

What is the matter with Steel? Thousands have been asking themselves that question during the past few days. Steel has been sagging steadily until now the preferred is bringing less than what was asked for the common when the corporation was formed. The price of the preferred is practically cut in two. Is its value equally depreciated? Steel preferred ought to be worth 100 cents on the dollar and as far as the layman can judge from externals it is actually worth it. There is no corporation whose tangible assets are so real as those of the Steel Corporation. Last year it transported out of its own mines 16,500,000 tons of ore. That is more ore than is mined in the whole of Great Britain. Its control of the iron deposits is in even greater proportion. It is a conservative statement that the Steel Corporation owns two-thirds of the Lake Superior iron mines. Four-fifths of all the iron ore used in the United States comes out of the Lake Superior iron mines. As far as the market for raw material is concerned the Steel Corporation is absolutely independent. All the steel works in Great Britain put together are not as big as the Steel Corporation. As far as regards the ton-cost of steel the Steel Corporation can make it more cheaply than anyone else. Moreover, it has the biggest market in the world in which to dispose of its wares. There is no home market like that of the United States. It can always dispose of its surplus abroad by merely cutting under the price of the foreign producer. Then what is the matter with Steel? Why should such a security as this be literally slaughtered? Of course forced liquidation has had something to do with the decline in price. Manipulation has probably something to do also; but neither liquidation nor manipulation could provoke the wholesale distrust which characterizes the Steel shares today. Is not the real base of lack of confidence in the management accentuated by the disclosures of startling financial immorality among those who were big in its councils less than a year ago. That was a sorry mess of dirty linen that Receiver James Smith aired in his report of the United States Ship Building Co. Mr. Andrew Carnegie said that given the personnel he could in four years re-establish the Carnegie steel works. That was probably hyperbole but it was a good way of emphasizing the value of personality. What the Steel Corporation lacks is personality. It lacks the close, intimate, personal attention that a man gives to his private business, that devoted interest which, year in and year out, never flags. It would be ironical to say that any person is giving such attention to the affairs of the Steel Corporation. Schwab's conduct while president of the Corporation would certainly have ruined a private business. There is probably not a single big official in the Steel Corporation who is not up to his ears in something else. There may be an exception, like Corey, but the exception always prove the rule. No man can serve two masters. No man can carry on two enterprises without slighting one or the other. When the head of a department is notoriously deficient the subordinates cannot be expected to be otherwise. It is a difficult matter to give so vast a body as the Steel Corporation cohesion but if all of its officials had a single purpose in life, and that purpose the care of the affairs of the Corporation, it would be better cemented than it is. Little leaks have an unhappy fashion of becoming big ones. Inattention on the part of one man is trifling, but inattention on the part of 165,000 is a mighty serious matter. There is no corporation so strong as to forever withstand constant and unnecessary drains. The biggest pond will empty in time. Reckoning the common as a bonus the capital stock of the Steel Corporation can not be regarded as excessive. Its tangible assets in the common market are worth the sum of its preferred stock and bonded indebtedness; but it was unadulterated folly to distribute \$40,000,000 in dividends upon the common stock as it has done. The corporation needed that money for the transaction of its own business. It has always needed it and it needs it now more than ever. The matter with the Steel Corporation is lack of wise and judicious management.

THE SHIP BUILDING SCANDAL.

Probably the most charitable thing that can be said about the organization of the United States Ship Building Co. is that it is the work of amateurs. No recognized authority in the financial world had anything to do with it. However, it is to be supposed that every mortal is born with a certain intuitive sense of right and wrong and it is surprising that this inherited knowledge did not come to the rescue of some of them. It seems incredible that they should have supposed it would never be known. That poor company never had the slightest chance to live. It was never for a moment a going concern and never had any prospect of being such. Not one of the promoters stands as high today in the opinion of his fellowmen as he did before he went into this company. No man can read the report of the receiver and not feel contempt for such a breed of promoters. It is useless to deny

the mischief which this exposure has caused. It has made the investing public look with suspicion upon legitimate enterprise, which, added to the general downward trend of prices, has served to unsettle industrial affairs generally. But it is to be remembered that the promoters of the ship building company do not represent the sober business element of the country. The central figure was already discredited before the company was formed. It is to be hoped that the redress that Mr. Smith, the receiver, recommends, is to be obtained—that of recovery from the promoters and organizers of the securities which they received without consideration. The affair, however, is not without its lesson. It has pointed out some radical defects in the New Jersey corporation law which that state, for its own good, should amend. In the first place the details of organization should not be attended to by clerks in the employ of some trust company; they should be carried out by those who are responsible for the company. Again there should be strict rules concerning the character of the allegations in the prospectus. Assuredly it should be a truthful document. It should not be drawn deliberately to deceive as the prospectus of the ship building company apparently was, for it bore no relation to the truth whatever. A personal liability on the part of the parties most interested in floating these glittering documents would be a salutary provision. It is not likely that the country will be disgraced for some time to come with such a departure from the financial code of ethics, but if anything comes of it to safeguard the interests of stockholders in other enterprises of doubtful merit the exposure may not have been in vain.

WILL INFLUENCE LAKE SHIPPING.

The enlarging of the Erie canal, which now seems to be an assured fact, will, in the opinion of those who have studied the movement of freight on the great lakes for many years past, prove a great stimulus to lake shipping. It has been apparent during the past few years that grain was seeking other outlets than through the port of New York. The shipments from southern cities have been constantly increasing and those from New York as constantly decreasing. That has meant that grain has been leaving for southern coast ports by rail to the detriment of lake traffic. When the canal is completed New York will for eight, and probably nine months, in the year receive its grain by water at a rate so advantageous that southern cities cannot hope to compete. The completion of the Erie canal will make New York the great grain shipping port of the United States. It will also undoubtedly check the present deflection through the St. Lawrence river channel. In its influence in establishing a trade current, solely and singly for the benefit of the United States, no measure has been projected which is calculated to do more than the enlargement of the Erie canal. Lake men are thoroughly alive to the situation and undoubtedly by the time the canal is completed various companies will have been formed and boats built to operate upon the canal. Meanwhile, of course, the present canal will be kept in commission, notwithstanding all reports to the contrary. The act of enlargement contains the provision that the canal must be kept in commission. A 1,000-ton boat is, in these days of 20,000-ton steamers and coming 10,000-ton lake freighters, a small affair, but the time is not long since a 1,000-ton boat was a vessel of respectable dimensions. A railway train of twenty 50-ton cars can haul no more than 1,000 tons and that is a greater burden than the ordinary locomotive hauls. There can be no comparison in cost between water and railway haulage, and undoubtedly the completion of the deepened canal will make a substantial reduction in the cost of grain delivered in New York. The whole community will benefit by that reduction. Whenever a cheap mode of transportation is substituted for a costly one the whole world becomes the gainer. When tea was \$5 a pound it was the beverage of the rich; now with lessened cost it is the common beverage of mankind. It is by the cheapening of products, and nothing cheapens them like transportation, that wealth is multiplied and comforts distributed. The enlargement of the Erie canal cannot work harm in any direction. It will even benefit the railways by the creation of diversified industries and the consequent multiplication of freight. The canal will never do a package business. That will belong to the railways as now, the only difference being that there will be more of it to do.

It is the opinion of the New York state engineer that work upon the canal will begin next May and he hopes to see it finished in five years. With the quickened conscience of the commonwealth, and the scrutiny that the work will undergo, there will probably be little chance for corruption; and with the work divided into sections under charge of competing contractors the time limit may even be reduced. Certainly no public undertaking of recent years has attracted attention of wider interest. The whole lake region is looking forward to it.

HARTER'S BALL JOINTS.

It is well known that the ordinary telescopic expansion joint for steam pipes, although suitable for low pressures, is not always satisfactory with the high steam pressures now common. In the first place it is not possible to provide for the enormous thrust

to a reduced scale in Figs. 1 and 2, Fig. 1 being a plan view and Fig. 2 a cross section through the main pipe, showing one pair of ball joints in elevation. It will be seen that while one socket piece is bolted direct to the stop valve on the boiler the other is bolted to the main pipe. As the pipe expands the end

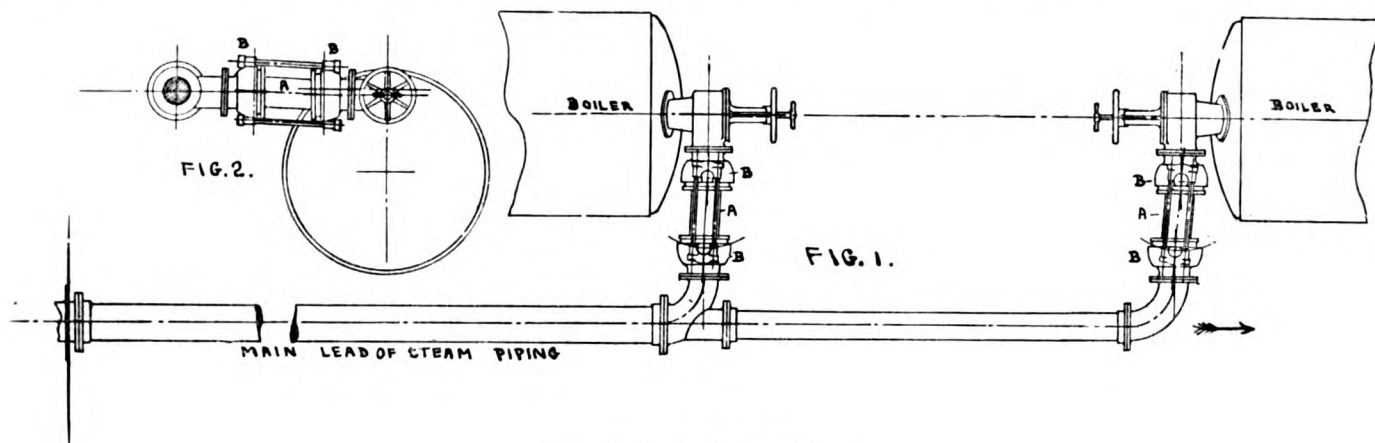


Fig. 1 and 2. Harter's Ball Joint.

exerted by the telescopic joint without heavy and costly staying arrangements, which also often still further impair the efficiency of the joint. Another trouble with the ordinary expansion joint is that of keeping the gland tight, chiefly on account of there usually being some side play of the pipe end in the stuffing box, in addition to the longitudinal movement. The result of this is that in a vain attempt to stop leakage the gland is often screwed up so tight that the pipe is gripped fast in the stuffing box and

moves in the direction of the arrow (the other end being supposed anchored), and the pair of ball joints at each boiler act as swinging links connecting the boilers to the main pipe in a perfectly flexible manner. The movement shown in Fig. 1 is that shown enlarged in Fig. 5, while the movement that takes place in Fig. 2 is that due to the top of the boiler itself rising with its own expansion and is shown in detail in Fig. 3. It will be seen that these joints can be arranged to give a connection to a boiler

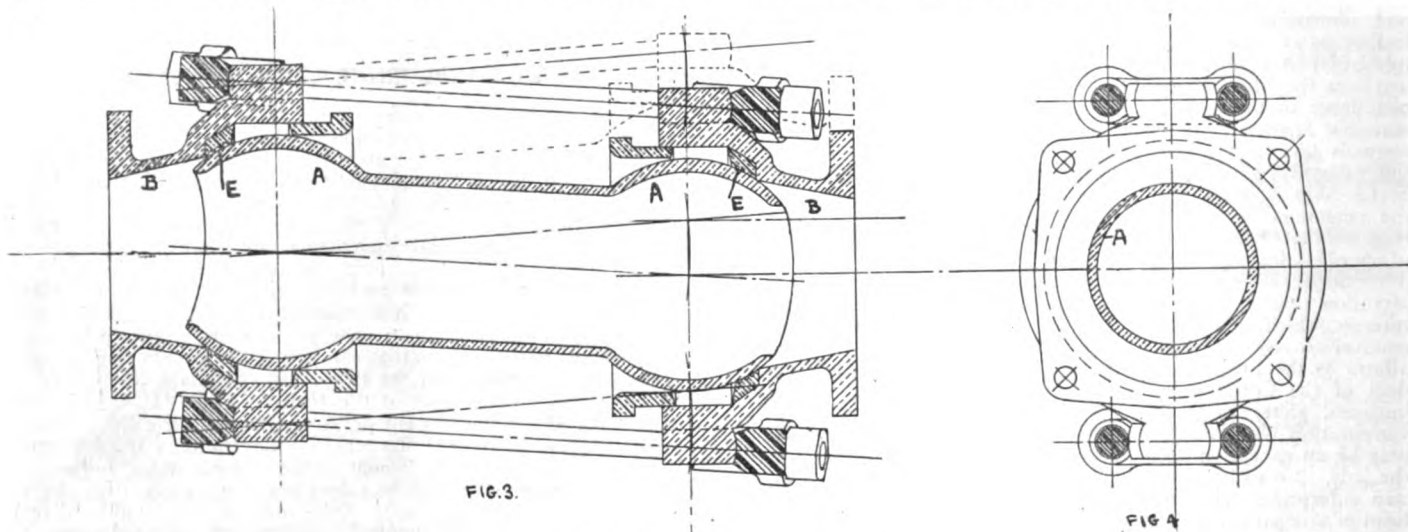


Fig. 3 and 4. Harter's Ball Joint.

the joint is then useless. To meet these and other difficulties the special ball joint shown on the accompanying drawings has been invented by Mr. Godfrey Harter of 1025 Walnut street, Philadelphia.

Referring to the drawings, Figs. 3, 4 and 5 show a pair of these ball joints arranged to act as an expansion joint, while Figs. 6, 7, 8 and 9 show another form of the joint arranged to act as a universal joint, giving movement in any direction. It will be noticed that, unlike any other kind of ball joint, the ball pieces "A" are held in place by outside stays, which are pivoted to the socket pieces "B," and which resist any tendency of the ball pieces to blow out of the sockets, no matter how high the pressure, while it leaves the joint free to swing with very little friction. Steam tightness is provided for by an ordinary gland and stuffing box, as shown, which is entirely independent of the means of holding the ball in place.

Referring now to the universal joint type (Figs. 6-9), it will be seen that the stays are pivoted onto a wrought steel ring at "CC," while the ring is itself pivoted onto the socket piece at "DD," the axis of the pivots "DD" being at right angles to that of the pivots "CC." This allows the ball piece "A" freedom to swing in any direction while maintaining the ball central in the socket.

In the expansion joint type, Figs. 3, 4 and 5, the steel ring is dispensed with, and the stays, which for convenience are made double, are pivoted direct onto the lugs on the socket pieces, as shown. These lugs are made spherical, in order to allow of slight movement as shown in Fig. 3, the axis of the lugs in one socket piece remaining parallel to the axis of the lugs in the other. The principal movement is, however, in a plane at right angles to this, as shown in Fig. 5.

The application of these joints as expansion joints is shown

or engine, etc., that is absolutely free in any direction, as well as taking up the expansion of the pipes without causing any unbalanced end thrust whatever. The piping is all in one plane, there being no vertical bends, so that there are no pockets where water can collect to cause danger. The horizontal bends may be made as easy as desired.

An important feature of these joints is the facility with

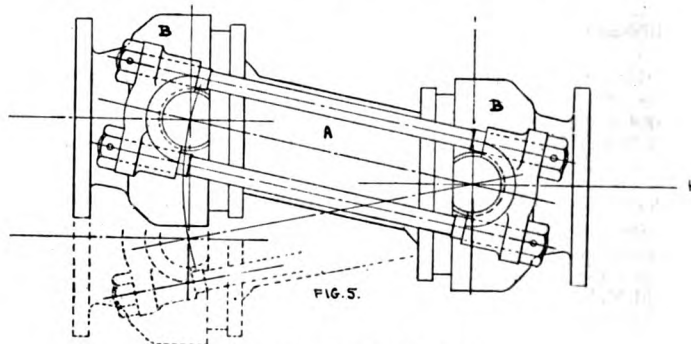


Fig. 5. Harter's Ball Joint.

which they can be kept steam-tight. Water grooves are arranged on the inside of the socket piece or in a separate bush, as shown on "E." This is always in contact with the ball piece and assists steam-tightness. There is also the stuffing box for soft packing. Owing to the fact that the width of the packing space can never change, it is a simple matter to keep the gland tight. This is not

so with most stuffing boxes, as, although they may be quite tight as long as perfect alignment is maintained, they cannot be kept so where there is any side play. There must be, of course, always perfect alignment with the ball joint on account of the working surface being part of a true sphere.

It is frequently the case that the principal strains on piping and its joints are not due to the internal pressure, but are due to

made up by a re-apportionment of the machinery weights looking to the omission of unnecessary pipes, valves and fittings. The space required for the re-arrangement plant should be insisted upon in all new designs.

The board believes that the boilers of the *Maine* are fully equal to the work they were designed to do, and see no reason why they should not continue to do this work, provided they are given the care necessary for the efficiency of any water-tube boiler. From the experience with the boilers of the *Maine* on this voyage the board concludes that while clean, fresh water is necessary for the life and efficiency of any water-tube boiler it is no more a necessity for the Niclausse boiler than for any other boiler of the large-tube variety.

Forced draft is unnecessary and undesirable for these boilers as installed in the *Maine*, and the board recommends that forced draft be never used with them, but that any increase in power for the engines should be obtained in all cases by adding to the number of boilers in use. This recommendation is not intended to prohibit the use of the blowers with open fire room for ventilating purposes. The board's conclusion that forced draft should not be used with the boilers of the *Maine* need not, and does not, apply to the same type of boiler differently proportioned.

It is recommended that one of the boilers in the *Stirling* works be set up and tested under a forced draft strong enough to give a rate of combustion higher than will ever be required of them in service. The test will show whether the limit of capacity is likely to be reached under service conditions.

The board concludes by saying that the boilers of the *Maine* are a fine example of mechanical work and to keep them in order will require the services of men of intelligence and mechanical skill. The water-tube boiler calls for more brain work, and at the same time less physical effort, on the part of the fireman.

DELAWARE RIVER SHIP BUILDING NOTES.

Philadelphia, Nov. 11.—The sea-going tug *Wyomissing*, being constructed for the Philadelphia & Reading Railway by the Neafe & Levy Ship & Engine Building Co. was launched at that company's yards last Saturday. Officials of both companies witnessed the event. The *Wyomissing* has a steel hull, 115 ft. long, 24 ft. beam and 13 ft. depth of hold. She will be equipped with a 750 H. P. compound engine, the most powerful ever placed in a vessel of her size by the Neafe & Levy company. She will have a Scotch tubular boiler capable of 130 lbs. working pressure. The new boat, which will be completed in about three weeks will be used in New York harbor. Capt. Vermont Stiles will command the vessel. The *Wyomissing's* sister tug, the *Conestoga*, was also launched last Saturday at the yards of the Maryland Steel Co., Sparrows' Point.

The 350-ft. steamship being constructed by the New York Ship Building Co. for the Merchant & Miners' Transportation Co. will be completed early in March. It is the intention of the ship building company to make a new record in the construction of this class of steamships. The keel was laid Oct. 8. The second fire boat being built for New York city will be launched within three weeks and will most likely be named the *George B. McClellan*, after the mayor-elect. No time has been fixed for the launch of the government dredge that is being built for use in southern waters, but the work is well under way. A large force of draughtsmen, under the supervision of Naval Constructor Baxter, are busy on the plans of the battleship *Kansas*. The Delaware Marine Supply & Manufacturing Co. of Wilmington, who furnished over 300 hinged square and round lights for the steamships *Manchuria* and *Mongolia*, were given a hurried order to supply the same and allowed until Oct. 17 to deliver the goods. The company had them ready three days ahead of time.

C. Allison Godshalk, a wealthy local manufacturer, is having a boat built in one of the Delaware river yards which in some ways may be considered remarkable. It is designed as a power-launch (to be propelled by gasoline) and Mr. Godshalk intends it to be "fast." To achieve speed almost every other consideration has been sacrificed, and Mr. Godshalk, who has been a student of marine construction, is backing his ideas with hard cash. The launch will be of finest mahogany, 40 ft. long and only 4.5 ft. wide. The engine will be of 70 H. P. The bow will be as sharp as the proverbial needle's point and it is expected that the boat will attain a speed of 25 knots. Her owner will ship her to England if she makes the speed expected and enter her in the Harmsworth cup race on the Thames, an annual event.

An order was made in New York last Friday by Judge Cox of the United States district court directing the William Cramp & Sons Ship & Engine Building Co. to furnish T. H. Adrian Tromp, a resident of Holland, with data and figures concerning the Turkish cruiser *Medjida*, now nearing completion at the Cramp ship yards. Tromp alleges that in 1899 he visited Turkey as agent of the Cramp company, taking with him certain plans and specifications for a cruiser of war. Negotiations were carried on until he returned to Holland, whereupon they were continued by the Cramp company. Tromp claims credit for the pact to build the Turkish cruiser.

The tug *J. F. Hanson*, built for the Ocean Steamship Co., was launched at Roach's ship yards, Chester, last Saturday. It has a steel hull, is 108 ft. over all in length and is equipped with compound engines. Its speed is 10 knots. This vessel is also built for service in New York harbor.

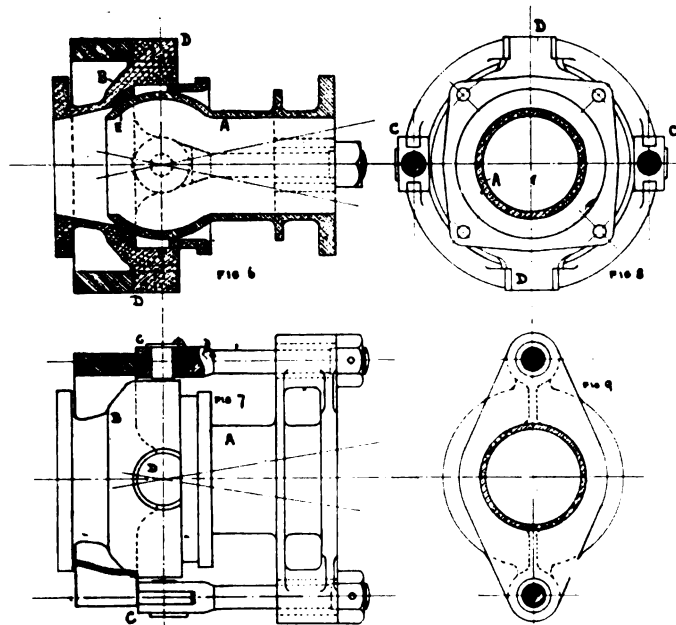


Fig. 6, 7, 8 and 9. Harter's Ball Joint, Universal Type. For High Pressure Pipes.

bending action on the pipes, caused by expansion, vibration, etc. Hence it will be seen that the employment of flexible connections such as that described above should enable much weight of material to be saved. These ball joints are in use in the British navy for the main steam pipes of the 30-knot destroyers *Greyhound*, *Racehorse* and *Roebuck*, and are now being fitted in the first-class cruiser *Antrim*.

BATTLESHIP MAINE'S BOILERS APPROVED.

An elaborate report on the recent test of the Niclausse boilers of the battleship *Maine* has been filed with the secretary of the navy by the trial board, consisting of Capt. J. A. B. Smith, Com'dr W. B. Bagley and Lieut. Com'dr W. M. Parke. The run was from Hampton Roads to Culebra and return. The *Maine* has twenty-four Niclausse boilers, arranged in three groups, with a total grate surface of 1,353 sq. ft. and heating surface of 53,343 sq. ft., providing for 17,848 I. H. P. There are twelve Sturtevant blowers for forced draft on the closed-fire-room system. In addition to the vessel's engineer force of 225 men, seventy-eight experienced men were taken for the run. The run down, 78.37 hours, was at an average speed of 15.1 knots, and the return, 76.3 hours, at 15.9 knots. No attempt was made to force the fires. The boilers on the run down gave no trouble and there was no difficulty in getting at times 115 revolutions of the main engines. The boilers responded quickly to the varying demands for steam. The coal used, going and coming, was 1,473 tons. The average rate of combustion per square foot for the run north was 16.45 lbs. and the average coal consumption per indicated horse power 2.45 lbs.. a poor result, due, the board says, to the use of too many boilers for the number of revolutions.

The board recommends that the distillers be placed higher up in the engine room hatch so as to give a rise to the steam pipes from the evaporator, both for the distillers and for the condensers; that new coils for the evaporators, with composition heads instead of cast-steel heads, be furnished and fitted; that baffle plates be fitted in the evaporators and that removable sheet metal casings be provided for the heads of the evaporators in place of the present canvas covers.

The board is of the opinion that in future the entire arrangement of the plant on board ship for making fresh water, and also the arrangement of the pumps feeding it to the boilers, must be radically changed, if water-tube boilers of any design are to be a success. Upon this point the board says specifically: "This problem of providing fresh water, and of keeping fresh and salt water apart on board ship, is of the very first importance. It is of more importance than the question of what type of boiler to use, for all types of water-tube boilers depend upon the solution of this problem for their existence." The board recommends the investigation of this subject by a special committee. This special committee could take up the question of the best type of evaporator and distiller for use on ship board, and also the question of main condenser—whether two main condensers should be used in each engine room and the auxiliary condensers dispensed with; also the best type of grease extractor and its location in the feed line, and what further precautions should be taken to keep oil out of the feed water. Part of this addition weight might be

TWO TURBINE STEAMERS FOR ALLAN LINE.

They Will be Placed in Canadian Service, one of Them to be Completed by July Next—Prices of Iron and Steel Falling—Scotch Ship Building Letter.

Glasgow, Nov. 2.—While we hear from New York that the Cunard turbine commission are expected to spend three months in that city experimenting with the two kinds of turbines there, the Allan Line has decided to build another turbine boat and tenders are invited from ship builders. To Messrs. Workman, Clark & Co., has been entrusted the order for the first twin-screw turbine mail steamer for the Canadian service of the Allan Line. When the order for the new steamer was placed in their hands there was no intention to have turbine engines, and it was only later that the experiment was decided on. The new ship will be launched in July of next year, and the turbines will be brought over from Newcastle to be fitted, so that the ship will make her trial trip in the Irish channel. The new liner will have three propellers, each with its own shaft. The keel of the ship having been laid before it was decided to adopt the turbine, very considerable alterations from the original design of the stern were rendered necessary as it was originally designed for twin screws. Before the new Cunarders are launched the Allan ship will, it is hoped, have settled the question of the success of turbine engines in vessels of her class, so far as the Parsons turbines are concerned. When at the last summer meeting of the Institution of Naval Architects reference was made by Mr. Parsons to the possibility of the new Cunarders being fitted with turbines, and it was mentioned that builders and engineers would soon be face to face with a revolution in ocean-going ships, few were aware of the meaning. The dimensions of the new Allan liner, as originally designed, are: Length, 520 ft.; width, 60 ft.; depth, 42 ft. 6 in. She is to have accommodation for 1,300 passengers and is to be the finest passenger steamer in the fleet. She was designed first to be driven by triple-expansion engines, giving a speed of 16 knots. It is expected that with the boiler power originally contemplated, and with no greater coal consumption, the turbines will drive the vessel at 18 instead of 16 knots. The second turbine boat is to be 550 ft. long, of 12,000 tons gross, 30,000 I. H. P. and to have a speed of 17 to 18 knots.

PERIOD OF LOW PRICES FOR IRON AND STEEL.

We seem to be coming to a period of low prices for all iron and steel material, although pig iron makers in this part of the world show great reluctance to follow the downward course of prices in the warrant market, and also in America. The iron warrant market is, of course, affected by the American advices, not by the state of the stocks of iron, which are every week getting smaller and smaller. Indeed, warrants are now so exceedingly scarce that short sellers have to pay heavily for the loan of them on settling days in the ring. There are now fully as many furnaces in blast in Scotland as a year ago and smelters are getting rid of their iron without storing; nevertheless the pressure on them is not so great as it was, and all of them are probably accepting less than their quoted prices, which, however, are a good deal above the equivalent of warrants. The drop in warrants has been about 1s. per ton within a week, and Scotch G. M. B. is now 49s., Cleveland 42s. 6d. and Cumberland hematite 54s. These are low figures, and a significant feature is the extreme dullness of hematite—or steel-making iron—so much so that several furnaces have been blown out in the Cumberland district, and in Scotland and Cleveland several have been turned off this quality on to ordinary iron. East coast hematite is now down to 52s. 9d., and Scotch hematite to 58s. to 59s. delivered to steel works.

This would presage lower prices for ship plates but makers do not quote anything lower, and, as I have already reported, are even talking about a common agreement for a standard minimum price. I don't think they will manage it. The steel trade is not cheerfully impressed by the reported sale by the United States Steel Corporation of steel bars delivered in Swansea at 7s. 6d. per ton under local makers. The quantity is small, but a straw may show the way the wind blows. In the Glasgow market the Steel Corporation has been touting for orders for steel billets, bars, blooms and angles, and also for plates. Little business has yet resulted, so far as I can learn, but when a seller solicits offers it usually means business—at a price—sooner or later. It is not likely that America can yet undersell our local makers in steel ship plates, but there is no saying how soon the time may come, with markets on the down grade.

The decline in the iron markets has given no stimulus to ship building. A few, very few, contracts have been placed during the month for cargo boats at prices ranging from the equivalent of £5.12.6 to £6 per ton. These are low rates considering the prices of material and the high wages still current, and are probably only accepted to keep the yards going. Ship owners would, no doubt, be tempted to order were there only some improvement in the freight market—but it never comes. Some of our Clyde ship yards are very badly off for orders and at one large establishment a considerable number of men are being paid off this week. The contracts on hand are about 150,000 tons under the total at this time last year, and there are no more of any consequence in the air, although within the last week or two some of the shipping companies have begun to ask quotations, as if they were beginning to suppose that it might be by-and-bye worth while thinking whether they should not begin to consider if they should not start to think about buying. When

there is an order on offer the competition of builders is tremendous.

NAVAL EXPENDITURES OF VARIOUS NATIONS.

French naval critics are uneasy at the smallness of the naval expenditure by their government. The vote for 1904 is £12,517,237, which is £20,000 less than in the previous year, and only £260,000 more than in 1902. France has been economizing while other nations have been adding to their naval strength and expenditure. Compared with two years ago the increases are very striking. The British vote has gone up £4,000,000, the German £1,000,000, Russian £500,000, and the United States £600,000. In eleven years British expenditure has increased from £17,500,000 to over £36,000,000, or by £19,000,000, Germany by nearly £7,000,000, Russia by £5,750,000, the United States by £10,500,000 and France by only £4,000,000. Japan in 1892 spent only £886,000. The comparative figures as given in a French naval memorandum are as follows: Britain, £36,000,000; United States, £16,300,000; Germany, £11,140,000; Russia, £11,060,000; Italy, £4,000,000; Japan, £3,230,000, and Austria, £1,800,000. In the new French naval budget £2,920,000 is to be spent on advancing the new ships in course of construction. There are in process of building six battleships, and the year's vote for them represents 30 per cent. of their total value. The new cruiser, Ernest Renan, which was ordered from the St. Nazaire Co. on Oct. 5, is to be delivered in 1908. The design has been somewhat modified, principally in respect of armament, and the change is directly opposed to the practice in Great Britain, where heavy guns are preferred in the primary armament of armored cruisers, even if the number may have to be reduced. In the Duke of Edinburgh class, of about the same tonnage as the Ernest Renan, we have six 9.2-in. guns and ten 6-in., while the French have changed the original idea of two 9.4-in. into four 7.6-in. weapons, retaining the original twelve 6-in. guns. The French ship is 515 ft. long, of 13,644 tons displacement, and with 36,000 I. H. P. will steam 23 knots. The Duke of Edinburgh class are 480 ft. long, of 13,550 tons displacement, and with 23,500 I. H. P. are to steam 22.33 knots. The cost of the French cruiser is estimated at a much higher rate—£1,317,960.

The first large consignment of the new American cotton to arrive at Manchester this season was brought by the steamer Manningtry a few days ago. The shipment, consisting of 2,250 bales from Savannah, may be said to have opened the season, though several small quantities had previously arrived. This service is to be maintained with Manchester direct by several first-class steamers.

When Troon harbor was purchased by the Glasgow & South Western Railway Co. they acquired with it an old wood crane barge, worked by hand. This crane was built fifty-three years ago by the Portland Ship Building Co., the predecessors of the Troon Ship Building Co. It is being sheathed and caulked by the Ailsa Ship Building Co., in the old dock, an interesting relic of the old days of wood.

INTERESTING DATA ON COST OF SPEED.

Some interesting data on the cost of speed was recently secured at the trial of the British cruiser Cumberland. She was built by the London & Glasgow Engineering and Ship Building Co., and was designed for a speed of 23 knots, which she exceeded by half a knot. Her dimensions, like all of the County class, are: Length, 440 ft.; beam, 66 ft.; draught, 24 ft. 6 in.; displacement, 9,800 tons. The boilers number thirty-one and are of the Belleville type, and the engines are triple-expansion with four cylinders, their diameters being 37 in., 60 in., and 69 in. each for the two low-pressure cylinders. The trials consisted of a 30 hours' test at one-fifth power; 30 hours steaming at eight-elevenths of the power; and 8 hours at full power. The speed attained at the one-fifth power trial was 15.241 knots; the indicated horse power developed, 4,913; the coal consumption 2.1 lbs. per indicated horse power per hour. On the 30 hours' trial at eight-elevenths power the speed was 22.138 knots, the indicated horse power 16,452 and the coal consumption per indicated horse power per hour 1.98 lbs. In the 8-hours' full-power trial the figures were: Speed 23.7 knots; indicated horse power 22,769; coal consumption, 2.01 lbs. It therefore works out that to increase the speed from 15.241 knots by 6.897 knots required an augmented coal consumption per 24 hours of 240 tons, while to increase the speed by a further 1.562 knots meant the consumption of an additional 140 tons of coal; or to put it in other words to increase the speed a little over 50 per cent. required a coal consumption of over 400 per cent. greater.

Cornelius Shields, president of the Consolidated Lake Superior Co., in a recent interview at Sault Ste. Marie, said: "The only plan we are calculating on to save the Consolidated Lake Superior Co. is the reorganization plan of the stockholders. They are the real proprietors of the works and are much more anxious to save them than anyone else. I have every hope that the plan will work out successfully. There has been so much mystery about the plans of the English syndicate that the directors are not depending on it at all. The works were not to be permanently opened until the entire reorganization plan had been completed, but owing to a large quantity of raw material being on hand for the pulp and veneer mills I have advised the directors to use it and run them as soon as possible."

SUMMARY OF NAVAL CONSTRUCTION.

Six per cent. appears to be the lead that the battleship Louisiana has set for the Connecticut. According to the summary of naval construction, issued by the bureau of construction and repair, navy department, the Louisiana has maintained steadily that percentage of lead. What the eventual outcome will be remains to be seen, but it is not likely that the government-built battleship will win. Steady progress is being made on all craft excepting one of the latest batch of battleships and armored cruisers remaining to be laid down—the Vermont at the yard of the Fore River Ship & Engine Co., Quincy, Mass. Following is the summary:

Name.	Building at	Degree of completion. Per Cent.	
		Oct. 1.	Nov. 1.
Battleships.			
Missouri	Newport News Co.	98	99
Ohio	Union Iron Works	82	82
Virginia	Newport News Co.	44	47
Nebraska	Moran Brothers Co.	27	30
Georgia	Bath Iron Works	36	37
New Jersey	Fore River Ship & Engine Co.	45	46
Rhode Island	Fore River Ship & Engine Co.	45	47
Connecticut	Navy Yard, New York, N. Y.	18	21
Louisiana	Newport News Co.	24	28
Vermont	Fore River Ship & Engine Co.	0	0
Kansas	New York Ship Building Co.	3	5
Minnesota	Newport News Co.	3	4
Armored Cruisers.			
Pennsylvania	William Cramp & Sons	59	60
West Virginia ...	Newport News Co.	59	64
California	Union Iron Works	41	43
Colorado	William Cramp & Sons	63	65
Maryland	Newport News Co.	57	60
South Dakota	Union Iron Works	38	41
Tennessee	William Cramp & Sons	8	10
Washington	New York Ship Building Co.	6	8
Protected Cruisers.			
Denver	Neafie & Levy	97	98
Des Moines	Fore River Ship & Engine Co.	94	94
Chattanooga	Lewis Nixon	74	74
Galveston	William R. Trigg Co.	68	68
Tacoma	Union Iron Works	91	93
Cleveland	Bath Iron Works	99	100
St. Louis	Neafie & Levy	28	32
Milwaukee	Union Iron Works	31	35
Charleston	Newport News Co.	50	53
Gun Boats.			
Dubuque	Gas Engine & Power Co.	7	10
Paducah	Gas Engine & Power Co.	6	9
Training Ships.			
Cumberland	Navy Yard, Boston	0	0
Intrepid	Navy Yard, Mare Island	0	0
Training Brig.			
Boxer	Navy Yard, Portsmouth, N. H.	1	2
Torpedo Boats.			
Stringham	Harlan & Hollingsworth	95	95
Goldsborough	Wolff & Zwicker	99	99
Blakely	George Lawley & Son	99	99
Nicholson	Lewis Nixon	99	99
O'Brien	Lewis Nixon	98	99
Tingey	Columbian Iron Works	96	97
Steel Tugs.			
Pentucket	Navy Yard, Boston	87	90
Sotoyomo	Navy Yard, Mare Island	82	90

DOMINION OF STEEL IN VESSEL CONSTRUCTION.

A report from Lloyd's Register of British and Foreign Shipping summarizing the operations of the society for the year ended June 30, 1903, brings out some very interesting figures, not least of which relate to the relative extent of the employment of steel, iron and wood for ship building purposes in the United Kingdom. In the year referred to 99.79 per cent. of the tonnage classed was built of steel, .06 per cent. of iron and .15 per cent. of wood. At the close of the year 6,698 merchant vessels, registering nearly 17,509,000 tons gross, held classes assigned by the committee of Lloyd's register. Of this total, 6,729 of 11,685,082 tons were British and 2,969 of 5,758,056 tons were foreign. During the year 627 new vessels were classed by the committee of Lloyd's register. Their registered gross tonnage amounted to 1,250,420 tons. Of these vessels 575 of 1,182,265 tons were steamers and fifty-two of 68,155 tons were sailing ships. As compared with the figures for the preceding twelve months the present return, following the general movement of the ship building industry, shows a decrease of 199,485 tons as regards steamers. There is, however, an increase of 24,489 tons as regards sailing ships. Among the vessels classed during the period in question were, besides cargo and passenger vessels of ordinary types, nineteen yachts; 128 fishing vessels, principally steel steam trawlers; thirteen steamers for carrying petroleum in bulk—six of them intended to burn liquid fuel; four other steamers intended to burn

liquid fuel; as well as numerous tugs, barges, dredgers and river vessels. The average size of the steamers classed during the past year was about 2,056 tons, and sailing vessels about 1,311 tons. If, however, vessels of 200 tons be excluded from the average in order to avoid the diminution caused by yachts and small coasters, the average size of the steamers would be 2,588 and sailing vessels 1,849 tons. Of the new vessels classed during the year 1,004,759 tons, or 80 per cent., were built in the United Kingdom. As regards the ownership of the vessels 834,674 tons, or 67 per cent., were built for the United Kingdom, and 415,746, or 33 per cent., for colonial and foreign owners. Among the latter the United States leads with 76,269 tons; Austria-Hungary has 52,408 tons; Germany, 46,632 tons; Holland, 37,490 tons; Italy, 33,766 tons; Norway, 26,638 tons; British colonies, 23,574 tons; France, 23,354 tons; and Greece 21,210 tons. The society's returns show that the average tonnage simultaneously in course of construction, at home and abroad, has been about 1,045,000 tons. The range was between 1,021,577 tons, or 434 vessels, in March, 1903 and 1,083,597 tons, or 403 vessels, in September, 1902.

WOODEN SHIP BUILDING IN MAINE.

The wooden ship building industry flourishes in Maine this fall, many large and fine vessels being now in process of construction, while enough contracts have been taken recently to keep most of the yards busy through the winter. Percy & Small, Bath, Me., have, in addition to a five-masted schooner under construction, taken a contract to build for J. S. Winslow & Co. of Portland a six-masted schooner 280 ft. long, 48 ft. beam and 28 ft. deep, to register about 3,000 tons gross. The five-master will be launched in the spring and the six-master in July next. A four-masted schooner for the J. S. Drake fleet will be launched from the New England company's yard, Bath, about Dec. 1. A small crew is at work on the 2,000-ton schooner building in the Minot yard, Phippsburg, while the schooner in Bowker's yard at that place will be launched in a very few weeks. The barge Annie, built for the Baltimore & Boston Barge Co., was launched from the yard of the Kelley-Spear Co., Bath, last week. She is 221 ft. long, 35 ft. 6 in. beam and 18 ft. deep. W. H. Reed of Jonesport is to establish a ship yard at Bath where he expects to build two large vessels for which the frames are now being cut in Nova Scotia. One of these vessels will be 310 ft. long, or a little longer than the Eleanor A. Percy. At Rockport, Carleton, Norwood & Co. are building a four-masted schooner and have contracted for a similar vessel. At Rockland, Cobb, Butler & Co. are building a five-master and I. L. Snow & Co. a three-master. At Thomaston, Washburn Bros. are building a five-master and are soon to begin work upon another vessel of like size. Dunn & Elliott of Thomaston will build a four-master. At Camden, H. M. Beam will build two five-masters, the frames of which are now being cut in Virginia. William F. Palmer of Boston is also to let a contract for a five-masted schooner. At Bangor, E. & I. K. Stetson are about to launch a four-master of about 1,000 tons.

FAST AUTOMOBILE BOATS.

A mile in an automobile boat in 2 minutes and 26 seconds, or at the rate of 26 miles an hour, was a feat accomplished on the Hudson river at New York on Saturday last. The record was made on choppy water, going with the wind. On a second trial over the same course, going against the wind, the mile was covered in just three minutes. The craft that made this running is distinctly one of the new style, which have become known, first in France and now in this country, as automobile boats, instead of motor launches, because of the use in them of automobile engines, which weigh much less per horse power than the standard marine engines, and may be controlled perfectly by one individual, who also does the steering, the same as in an automobile. The boat is the production of a New York firm of automobile importers and is a tiny affair compared with the automobile launches with Mercedes engines, which, in France, recently scored 19 and 20 knots an hour in the races there. The craft, which had her first trial for a record Saturday, is only 30 ft. on the water line and 35 ft. over all. It weighs only about 1,000 lbs. all told. The engine is a four-cylinder, four-cycle affair, built somewhat after the Panhard pattern. It occupies a space 2½ ft. long by 2 ft. wide by 2½ ft. in height. It weighs 410 lbs. and develops 21 H. P. The standard marine engine of 100 H. P. weighs 3,000 lbs. The boat, which the builders have named Vingt et Un, has a hull of mahogany and is decked over from the prow to the engine, which is just forward of amidships. Behind the engine is a cockpit, accommodating four or five persons. The bow of the boat, like most speed craft, has a perky elevation in front and it has a torpedo boat stern. It is suggestive of high speed at sight. On the trial the boat was operated by A. D. Proctor Smith of New York, and three passengers were carried. Mr. Smith thinks that in smooth water, under favoring conditions, the boat will do a mile in two minutes.

The steamer Kanawha after being ashore nearly two days above Port Colborne was floated by lightering 3,000 bu. of her cargo of corn and taken to Buffalo for repairs.

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COAL A FACTOR IN LAKE TRADE.

But for Heavy Shipments of Both Anthracite and Bituminous this Year the Aggregate Movement of Freight of all Kinds Would be below 1902.

It is now quite probable that notwithstanding the great increase in coal shipments by lake to the northwest this season, the falling off in iron ore, grain and other leading items of freight from the head of the lakes will be so large as to cause a decrease, compared with 1902, in the total movement of freight to and from Lake Superior. The Sault canal reports to Nov. 1 still show an increase over 1902 (438,572 tons), but the season will close up so early that this increase will probably be wiped out before the end is reached. On Nov. 1 of this year 31,369,785 tons of freight had been moved through the canals, compared with 30,931,213 tons on the same date in 1902. The movement for the full season of 1902 was 35,961,146 tons. As against increases to Nov. 1 of 1,292,588 tons of soft coal and 909,603 tons of hard coal, there are decreases of 985,832 tons of ore, 1,740,180 bbls. of flour, 13,958,693 bu. of wheat, and a decrease also of about 5,000,000 bu. of grain other than wheat. Full summaries follow of combined reports of the canals, Canadian and United States:

Movement of Principal Items of Freight to and from Lake Superior.

ITEMS.	To Nov. 1, 1903.	To Nov. 1, 1902.	To Nov. 1, 1901.
Coal, anthracite, net tons.....	1,034,211	124,608	657,147
Coal, bituminous, net tons.....	5,197,255	3,904,667	3,318,643
Iron ore, net tons.....	20,538,577	21,524,409	16,283,109
Wheat, bushels.....	41,456,892	55,415,585	33,026,341
Flour, barrels.....	5,446,087	7,186,217	6,264,015

Report of Freight and Passenger Traffic to and from Lake Superior, from Opening of Navigation to Nov. 1 of Each Year for Three Years Past.

EAST BOUND.			
ITEMS.	To Nov. 1, 1903.	To Nov. 1, 1902.	To Nov. 1, 1901.
Copper, net tons.....	91,658	97,026	83,212
Grain, other than wheat, bushels.....	20,223,381	15,042,054	13,617,843
Building stone, net tons.....	14,790	35,804	42,884
Flour, barrels.....	5,445,977	7,186,207	6,263,620
Iron Ore, net tons.....	20,538,577	21,524,409	16,283,409
Iron, pig, net tons.....	20,716	11,878	26,302
Lumber, M. ft. B. M.....	857,325	955,757	931,985
Silver ore, net tons.....	1
Wheat, bushels.....	41,456,892	55,415,585	33,026,341
Unclassified freight, net tons.....	81,936	112,009	60,649
Passengers, number.....	27,671	28,988	26,870

WEST BOUND.			
Coal, anthracite, net tons.....	1,034,211	124,608	657,147
Coal, bituminous, net tons.....	5,197,255	3,904,667	3,318,643
Flour, barrels.....	60	235	395
Grain, bushels.....	3,998	18,627	56,493
Manufactured iron, net tons.....	142,105	156,335	121,128
Salt, barrels.....	362,407	382,519	396,236
Unclassified freight, net tons.....	462,333	513,131	403,331
Passengers, number.....	26,686	27,723	28,685

Summary of Total Freight Movement in Tons.

	To Nov. 1, 1903.	To Nov. 1, 1902.	To Nov. 1, 1901.
West bound freight of all kinds, net tons....	6,895,230	4,756,286	4,560,898
East bound freight of all kinds, net tons....	24,474,555	26,174,927	19,982,712
Total freight, net tons.....	31,369,785	30,931,213	24,543,610

	Vessel passages.	Registered tons.
To Nov. 1, 1903.....	16,815	25,275,590
To Nov. 1, 1902.....	20,001	27,754,698
To Nov. 1, 1901.....	17,421	21,329,455

LAKE FREIGHT SITUATION.

Rail shipments will probably have to be added to lake shipments of iron ore if the total movement of the season is to exceed 24,000,000 tons. There has been a steady slump in the movement of ore for the past month and it is, of course, growing more pronounced now. Practically none of what is now coming down is going to the furnaces direct, the furnaces feeling that they have already sufficient in their stock piles to carry them well into the winter. The October movement of ore was 3,006,857 tons or 304,569 tons less than that of October, 1902. The total movement to Nov. 1 this year is 22,383,350 tons as against 24,020,036 tons to Nov. 1 of last year or a decrease of 1,636,686 tons. None of the Steel Corporation steamers will load ore after the present week and other of the big shippers are practically out of the market. Still, notwithstanding the drastic curtailing of the move-

ment and the almost total absence of wild cargoes, the independent vessels manifest reluctance to go to the dock. Mr. Gilchrist expects to keep his fleet in commission for the balance of the month but some of the smaller class of carriers will probably have to seek winter quarters very shortly now. The lumber market was very firm at the beginning of the week but it is not likely that rates in this trade will further advance, as some of the ore carriers have entered it.

LAKE LABOR PROBLEM.

From the present outlook as to the lake trade next season it is quite possible that there will be so little to do as to leave no room for the struggle that has been looked for between labor organizations and the vessel owners. If differences are to be amicably arranged, however, a little more harmony than now exists in some of the organizations, both of owners and employees, will probably be necessary. It is well known that the recent trouble on the Steel Corporation vessels did not mend the strained relations within the Lake Carriers' association nor the feeling towards vessel owners who are not members of that body, and now it is said that there is considerable dissatisfaction with existing conditions in the Masters & Pilots' association. A considerable element on the lakes are desirous of in some way divorcing the lake membership from the coast. Still others are said to be desirous of eliminating the masters altogether and making it an association of mates. The recent struggle with the Pittsburg Steamship Co. has left its aftermath, which is, in this case, as it were, a brown taste in the mouth. A few of the mates have voiced the sentiment that in that affair they were merely utilized as the cat's paw to pull the master's chestnuts out of the fire. It was the mates, indeed, who forced the issue but it was the masters who profited. The mates were ordered to leave the ships; the masters stayed aboard. Yet it was the discontent of the masters with conditions aboard the Pittsburg Steamship Co. vessels that was the yeast that raised the leaven of discord. The mates are somewhat inclined to blame the masters and some of them have gone so far as to say that they favor an independent organization.

WILL SEEK LOAD-LINE LEGISLATION.

The announcement from Boston headquarters that the Masters & Pilots' association will endeavor to secure in congress the passage of a load-line bill will probably not be received with a great deal of enthusiasm by members who feel that there is room for great work within the association itself in advance of any effort to put forth legislation that will be looked upon as antagonistic to vessel owners. The task of harmonizing the interests of coast and inland membership in the Masters & Pilots' association has by no means been completed and there is much difference of interest also between masters and mates. Then, too, the outlook for employment in shipping lines generally is quite different from what it was a short time ago, so that the present does not seem like an opportune time for a campaign at Washington that must necessarily cause differences with employers. And it may be said further that to secure the enactment of a load-line law is no simple matter. It is not a new proposition and there are arguments on both sides, not least of which from the vessel owner's point of view is the general feeling that ships are already surrounded by and hampered with an unnecessary amount of government supervision. If the masters and pilots are wise they will give attention to the work of perfecting their organization and avoid unnecessary clashes with their employers over such a doubtful matter as their ability to put a load-line bill through congress.

The bill as proposed provides that the owner of every American steam vessel, except vessels of small register employed solely in fishing, and pleasure yachts, shall mark upon each of the sides of the vessel, amidship, in white or yellow, on a dark ground, or in black on a light ground, a circular disc 12 in. in diameter, with a horizontal line 18 in. in length, drawn through the center. The center of this disc shall be placed at such a level as may be directed by the local inspector of the district, and shall indicate the maximum legal load-line. If the vessel is so loaded as to submerge the center of the disc such submersion shall be a reasonable cause for the detention of the vessel. Any owner or master failing to cause his ship to be so marked, or allowing it to be submerged below the load-line, or any person who shall conceal or remove such a mark, shall be liable to a fine not exceeding \$1,000.

Other legislation is also proposed by the association. A second bill provides for the right of appeal from the decisions of the supervising inspectors. It provides that any person who feels aggrieved at the decision of the supervising inspector of the dis-

trict may take his case to the supervising inspector-general, who shall examine the evidence and revert the case for re-examination if in his judgment the testimony warrants it. This bill is otherwise so framed as to give to the supervising inspector-general final authority.

Another bill proposed is to extend the lien of mariners' wages to the masters. Other bills relate to the port of New York, seeking to limit the length of tow-lines and to prevent injurious deposits in the harbor.

These measures will be thoroughly discussed at the annual meeting of the Masters & Pilots' association which is to occur in Washington in January next.

TURBINE STEAMER FOR THE LAKES.

As further evidence that the turbine steamer is growing in popularity the Lake Ontario Steamship Co. has decided to put a vessel of this type on its Toronto-Hamilton run in opposition to the Hamilton Steamboat Co. The new steamer will be built by the Hawthorne-Leslie Co., Newcastle-on-Tyne, and is to be delivered next spring. It will, of course, be of Canadian canal size, being 260 ft. long and having a carrying capacity of about 1,500 passengers. This will, in all probability, be the first turbine steamer to plow the lakes though others are spoken of. While there are some American-owned turbine steamers there are none as yet of American build; but undoubtedly they will come shortly. The turbine has gone beyond the experimental stage, otherwise the Cunard Steamship Co. would not soberly consider it for its new flyers and the Allan Line would not order two of them for North Atlantic service.

Absence of vibration is probably the distinguishing characteristic of the turbine-driven vessel as far as the passenger is concerned. But there are other and far more important considerations. The continuous rotation of the turbine, with constant pressure always in the same direction of rotation, accompanied by the total omission of the cranks, connecting rods and cross head guides of the reciprocating engines, all point to a much longer life without the serious wear and knocking which is the characteristic of engines in which the momentum of moving parts is constantly reversed. The strains upon the propeller shaft are, in the turbine system, due to steady and constant movements which are far less likely to lead to deterioration of the molecular structure of the shaft than the constant hammering of reciprocating pistons. Turbine steamers are in constant operation on the Clyde; they have already reduced the terrors of the English channel service; they are about to be introduced in the Irish sea service between England and Ireland; two, as noted, are now being built for the North Atlantic service of the Allan Line; and one is being constructed for service between Australia and New Zealand.

GENERAL CURTAILMENT AT ORE MINES.

Duluth, Nov. 11.—It is thought here now that iron ore shipments for the year will be little, if any, in excess of 24,000,000 tons, possibly not so large as that even. Minnesota is practically through. Only a few small mines on the western Mesabi and one or two in the central part of the range are working. The Steel Corporation is through; its mines, little and big, are on winter schedule. The open-pit steam-shovel properties are closed completely, the milling mines are developing underground only, and the underground properties are running on their regular winter basis. The independent mines are through, with the exception of Pickands, Mather & Co.'s Minorca which was still shipping at the commencement of this week. The situation is much the same on the older ranges. The Vermillion is through except that some stock piles are still busy. On the Gogebic nearly every shipper is done. Some of the big mines of the Oliver company are now stocking for next year. On the Marquette the mines owned jointly by the Steel Corporation and the Cleveland-Cliffs Iron Co. are still shipping, and some of them will make small shipments by rail all winter. Others on that range are quiet, so far as shipments are concerned, and some are down altogether. On the Menominee the big shippers like Chapin, Aragon, Pewabic, Penn mines, etc., are through and a great many others have closed for the winter and will not mine a ton of ore until spring or until they have better inquiry for ore. At the mines of Corrigan, McKinney & Co. little is doing; all but three of their Crystal Falls properties are closed tight. At Iron River and Amasa there is little doing for the winter.

Marquette and Ashland combined have not shipped 5,000,000 tons for the season, and Escanaba is 1,000,000 tons behind so far as the Chicago & Northwestern road is concerned, with but a trifle increase (too small to be worth considering) from the new Wisconsin & Michigan. The Chicago, Milwaukee & St. Paul is also below last year in shipments.

The movement of grain from this section has not been very satisfactory this fall from the vessel owner's standpoint. There is nothing new in freights. Stocks of all grains at the head of the lakes now amount to 9,541,000 bu., of which 5,012,546 bu. are flax, the largest amount of that grain ever in store here during the season of navigation. The increase of flax for the week was 1,334,311 bu. Receipts of all grains last week were 4,510,000 bu. and shipments 3,295,000 bu. There are 2,250,000 bu. of wheat here and 1,500,000 bu. of barley. Wheat receipts are large and of better quality than of late, but there is but 32,000 bu. contract wheat in store at the head of the lakes, so far as elevator reports indicate. On the other hand there is supposed to be at least 3,000,000 bu. of wheat sold for shipment east and to Chicago

at once. Country receipts are made to apply almost entirely on old sales, and there is very little of what comes offered for open sale from day to day. While the export market is weak, this feature of the situation seems very strong. Wheat alone was shipped last week to the extent of 2,300,000 bu. The Manitoba movement of wheat is more free and country marketings are excellent, with a good deal more of it turned Duluthward than toward Minneapolis just at present.

The last load of wheat for Montreal was loaded Tuesday, Nov. 10, which is later than usual. The last cargo for Quebec cleared Saturday, Nov. 7.

There is no change in flour manufacture at the head of the lakes. Four mills are running. Millers are satisfied with their profits and report both the American and export markets good. Mills here will close for a short overhaul in a month. Railroad flour docks are getting empty and receipts are shoved forward as fast as possible. There will be no flour left unshipped this fall.

CHICAGO GRAIN FREIGHTS.

Chicago, Nov. 11.—The freight market was only moderately active during past week. Some early South Chicago chartering for Buffalo became necessary at 1¼ cents the market re-acted shortly thereafter and is now ruling firm on a nominal basis of 1½ cents corn to Lake Erie and Georgian bay. To Lake Ontario vessel offerings are scarce and generally held around 4 cent corn. The out-movement of grain at the moment is unquestionably slow but there is, notwithstanding, a stronger tendency in rates, since under present conditions the round trip is productive of the very narrow, if any, margin of profit. Shippers appear anxious to get the grain under way by the 15th.

The first of fleet under the recent Duluth-Chicago wheat engagement, now estimated around 2,000,000 bu., reported early this week, and also two cargoes flax seed. The wheat brought from Duluth is to be blended with other wheat to bring it up to contract. Receipts from the west have averaged about 750 cars daily, very light for this time of year, but the wheat coming by lake from Duluth, if devoted to mixing purposes as expected, will have the effect of increasing our wheat stocks about 4,000,000 bu.

Returns to the department of agriculture on the corn production indicate total yield for 1903 (second largest crop on record) at 2,313,000,000 bu., or an average of 25.8 bu. to the acre compared with a ten year average of 23.9 bu. The average as to quality is 83.1 per cent. against 80.7 per cent. last year. It is also estimated that there is now in farmers' hands from the old corn crop of 1902 some 133,000,000 bu. The report indicates the flax seed yield (second largest on record) at 27,300,000 bu. compared with 29,285,000 bu. last year. No account of wheat is included with this government report.

Of the shipments noted below for the past week there was via all rail lines some 266,000 bu. wheat, 77,000 bu. corn, 1,000,000 bu. oats and 18,000 bu. rye; to Buffalo and other American points via lake some 190,000 bu. wheat, 1,750,000 bu. corn, 326,000 bu. oats and 118,000 bu. rye; and to Canada points via lake some 25,000 bu. of wheat and 334,000 bu. corn. The figures covering lake and rail shipments follow:

	This week.	Last week.	last year
Wheat, bu.	498,462	1,138,316	314,436
Corn, bu.	2,172,901	2,751,350	1,748,435
Oats, bu.	1,354,457	1,495,299	934,931
Rye, bu.	139,054	78,565	159,062
Total, bu.	4,161,874	5,463,530	3,156,864
		Since Jan. 1, 1903.	Same time last year.
Wheat, bu.		10,793,083	26,961,783
Corn, bu.		81,839,486	39,922,618
Oats, bu.		56,656,711	47,954,598
Rye, bu.		3,508,079	2,292,040
Total, bu.		161,797,359	117,131,939

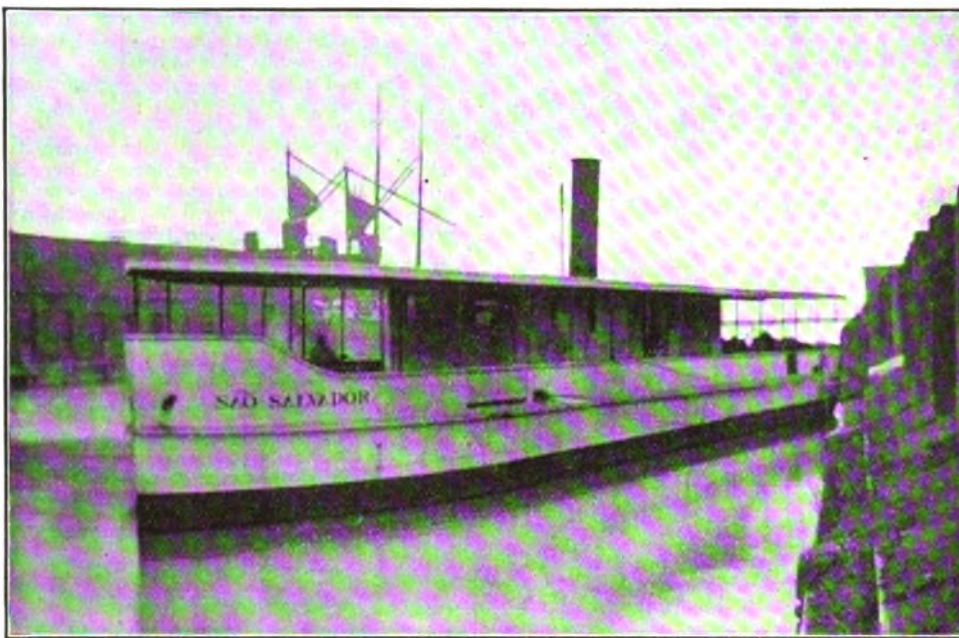
Stocks of grain in public and private elevators are reported as follows:

	Week just closed.	Last week.	Same week last year.
Wheat, bu.	5,464,000	5,209,000	11,371,000
Corn, bu.	4,321,000	4,204,000	1,198,000
Oats, bu.	2,741,000	2,825,000	4,189,000
Rye, bu.	260,000	238,000	302,000
Total, bu.	12,786,000	12,476,000	17,060,000

William McKittrick, for forty-three years a marine engineer, died suddenly at his home in Detroit last week. He was born at Oswego, N. Y., Jan. 12, 1839, and secured his first papers when twenty-one years of age. The civil war then broke out and McKittrick secured a position as engineer of Commodore Foote's flagship. At the close of the war he turned to the lakes where he remained continuously with the exception of two years spent at Washington in the mail equipment service. He was engineer in the Ward and Whitney lines. His last lake steamer was the Baldwin. He entered the employ of the Detroit, Belle Isle & Windsor Ferry Co. five years ago and was so employed at the time of his death.

TWIN-SCREW STEAMER FOR AMERICAN RIVERS.

Sao Salvador is the name of a twin-screw, shallow-draught river steamer which the firm of Charles P. Willard & Co. of Chicago, Mr. F. C. Walter, president and manager, has recently completed for South American parties. There were some difficulties involved in the execution of this contract, the specifications requiring that the steamer should have the greatest possible carrying capacity on the least possible draught, which, of course, entailed a flat bottom boat, while a further provision required the steamer to reach its destination under its own power. Consequently, although the craft is intended only for river navigation, it had to be staunch enough to weather an ocean voyage. All the conditions



Twin-Screw Shallow-Draught River Steamer Sao Salvador for South American Service.

[Built by Charles P. Willard & Co., Chicago.]

have been satisfactorily fulfilled in the vessel as completed. General dimensions of the Sao Salvador are as follows: Length over all, 90 ft.; keel, 84 ft.; beam at deck, 16 ft. 6 in.; beam at guards, 17 ft. 4 in.; depth, molded, 6 ft. 4 in.; draught loaded, 4 ft.; displacement, 96 tons. The hull is built of steel throughout and is sub-divided into five watertight compartments. While the accompanying photograph shows only one deck the steamer is really a double-decker. The main deck is given over to freight purposes with crew's quarters aft. The second deck contains the pilot house, owner's cabin, dining room, staterooms and berths for twenty-five passengers. The wood work is entirely of cypress. The steamer is primarily designed for carrying such freight as rubber, coffee, sugar and fruits on the rivers of Brazil and as the rate for this class of merchandise is very high the business is expected to be extremely profitable.

The steamer is equipped with two compound engines located amidships, with cylinders of 6 and 12 in. diameter and stroke of 8 in., supplied with steam from a Scotch water-back boiler, 6 ft. in diameter and 9 ft. long, allowed a pressure of 160 lbs. The grate surface is 20 sq. ft. and the heating surface is 583 sq. ft. The engines run condensing with an independent vacuum pump and drive a four-bladed 3½-ft. propeller wheel made of cast steel. The steamer is designed for a speed of 10½ miles loaded at 110 H. P. The boiler feed pump is a Worthington duplex. There are two 300-gallon tanks, and for fresh water use and the other to supply the deficiency which occurs from time to time running condensing. The coal bunkers will carry 10 tons each which will run the steamer 400 miles without recoaling. The steamer is provided with hand and steam capstans and also with iron tow posts for towing two steel barges of its own length which it is expected to do at the rate of from 5 to 6 miles per hour. The Chicago firm is expecting several orders for steamers of this kind.

FIVE YEARS TO ENLARGE THE ERIE CANAL.

The decisive victory of the Erie canal enlargement plan in the New York elections has caused much discussion throughout the press of the country. Some have ventured to predict that the legislature will frustrate the attempt to enlarge the canals, but Gov. Odell is of opinion that such an attempt would be unwise and fruitless. Other journals, especially those devoted to railways, declare that the enlargement of the canal will take ten years and that meanwhile the present canal will be inoperative. This view is not generally endorsed. The present canal can accommodate boats of 250 tons capacity and engineers are agreed that provision can be made for their operation during the enlargement. Moreover, competent authorities maintain that five years is sufficient time in which to complete the work. The people, having expressed their desire, it is now the duty of the state comptroller to cause to be prepared bonds of the state to the amount specified, and within three months after the issuance of the bonds, or some part thereof, by the comptroller, the superintendent of public works and the state engineer are directed by law to proceed with the work of enlarging the canals.

The \$100,000,000 of bonds are to be sold to the highest bidder. They will be issued for a term of not more than eighteen years, will bear 3 per cent. interest and will be exempt from taxation. To meet the interest charges on the bonds and to take them up at maturity the law provides that there shall be levied an annual tax of twelve one-thousandths of a mill upon each dollar of valuation of the real and personal property of the state subject to taxation, for each and every \$1,000,000 or part thereof in par value of said bonds issued and outstanding in any of the

fiscal years within the period for which the bonds are to run.

The opponents of canal improvement in the campaign questioned the estimate of \$101,000,000 for the improvement of the canals on the lines laid down, asserting that the actual cost would be far in excess of that figure. The estimate of \$101,000,000 is based upon the results of a survey by a competent board of engineers, including Alfred Noble, president of the American Society of Civil Engineers and selected by the Pennsylvania Railroad Co. to construct its tunnel under the Hudson river; and Maj. Thomas W. Symons, who has probably given more attention to canal improvement than any one man in America.

In order to guard against the possibility of the people having to pay more than they had been informed would be sufficient to defray the cost of the improvement, 20 per cent. was added to the actual cost as figured out by the engineers, and moreover, there was included in the \$101,000,000 estimate the cost of deepening the Hudson river between Troy and Albany and improvements also in Niagara river which is to be the western outlet of the canal. It is expected that these river improvements, however, will be made by the general government. The route of the improved Erie canal is to be as follows:

Beginning at Congress street, Troy, and passing up the Hudson river to Waterford; thence to the westward through the branch north of People's island, by a new canal and locks reach the Mohawk river above Cohoes falls; thence in the Mohawk river canalized to Little falls; thence generally by the existing line of the Erie canal and feeder around through Little falls to the Mohawk river above the upper dam; thence in the Mohawk river canalized with the necessary cutting through bends to a point just east of Jacksonburg; thence generally by the existing line of the Erie canal to Herkimer; thence in the valley of the Mohawk river, following the thread of the stream as much as practicable, to a point about 6 miles east of Rome; thence over to and down the valley of Wood creek to Oneida lake; thence through Oneida lake to the Oneida river; thence down the Oneida river, cutting out the bends thereof where desirable, to Three river point; thence up the Oswego river to the outlet of Onondaga lake; thence up the Seneca river to and through the state ditch at Jack's reefs; thence westerly generally following said river to the mouth of Crusoe creek; thence substantially paralleling the New York Central railroad and to the north of it to a junction with the present Erie canal about 18-20 miles east of Clyde; thence following substantially the present route of the canal, with necessary changes near Lyons and Newark, to Fairport; thence curving to the south and west on a new location joining the present canal about one-half mile west of the crossing of the Irondequoit creek; thence following the old canal to a point about 1¼ miles west of Pittsford; thence following the existing line of the canal for nearly a mile; thence running across the country south of Rochester to the Genesee river near Genesee Valley park; here crossing the river in a pool formed by a dam; thence running to the west of the outskirts of Rochester and joining the present canal about 1 mile east of South Greece; thence following substantially the route of the present Erie canal with the necessary change in alignment near Medina to a junction with the Niagara river at Tonawanda; thence by the Niagara river and Black Rock harbor to Buffalo and Lake Erie.

The existing Erie canal, from Tonawanda creek to Main street, Buffalo, is to be retained for feeder and harbor purposes.

The route of the improved Oswego canal is to be as follows: Beginning at the junction of the Oswego, Seneca and Oneida rivers, it shall run northward to a junction with Lake Ontario at Oswego, following the Oswego river canalized, and the present Oswego canal.

The route of the Champlain canal, as improved, will be as follows: Beginning in the Hudson river at Waterford, thence up the Hudson river canalized to near Fort Edward, thence via the present route of the Champlain canal to Lake Champlain near Whitehall.

All three of the canals—the Erie, Oswego and Champlain—are to be so improved that the canal prism shall, in regular sections, have a minimum bottom width of 75 ft., and minimum depth of 12 ft. The minimum water cross section is to be 1,128 sq. ft., except at aqueducts and through cities and villages, where

it may be reduced as deemed necessary by the state engineers and the canal board.

In the rivers and lakes the canal shall have a minimum bottom width of 200 ft., minimum depth of 12 ft., and a cross section of water 2,400 sq. ft. The locks are to be single, except the flight of three locks near Waterford and two locks at Lockport, which are to be double. These locks are to have a length between hollow quoins of 328 ft., a clear width of 28 ft. and a minimum depth in lock chamber of 11 ft., with such lifts as the state engineer may determine.

With regard to the manner in which the work shall be carried on the law says that the state engineer shall divide the whole work into sections, or portions, as may be deemed for the best interest of the state in contracting for the same. All work authorized shall be done by contract. No contract which exceeds by more than 10 per centum of the gross cost of the work, as estimated by the state engineer, or more than 20 per centum of the cost of any item in the state engineer's calculations on the work, shall be awarded, unless such award shall be approved by the state engineer, with the consent of the canal board. The canal board is to be composed of the lieutenant governor, state treasurer, attorney general, state engineer, commissioner of public works, the state controller, and the secretary of state.

Every contractor to whom a contract for work on the canals shall be awarded shall give an adequate security for the faithful and complete performance of his contract, and it shall be at least 25 per centum of the amount of the contract. If the work of a contractor is unsatisfactory the superintendent of public works has the power to cancel the contract and complete the work at the expense of the contractor. Contractors will not be paid more than 90 per cent. of the amount called for in their contracts until the value of the work performed by them is approved by the state engineer and the superintendent of public works. The governor may employ, at a compensation to be fixed by him, five expert civil engineers to act as an advisory board of consulting engineers, whose duty it shall be to advise the state engineer and the superintendent of public works, to follow the progress of the work and from time to time report thereon to the governor, the state engineer and the superintendent of public works as they may require or the canal board deem advisable. The state engineer may employ, and at pleasure remove, a special deputy, at a compensation to be fixed by him with the consent of the canal board, who may, under the direction of the state engineer perform on the work of improvement all of the duties of the state engineer, except as commissioner, trustee or member of any board. The state engineer may also appoint at pleasure such resident engineers in addition to those now authorized by law as he may deem necessary.

No cheap foreign labor can be employed in the building of the canal to the exclusion of citizens of the state. Chapter 454 of the laws of 1902 was enacted to cover just such a case as the building of the 1,000-ton barge canal. It is provided in this law that "in the construction of public works by the state or municipality, or by persons contracting with the state or such municipality, only citizens of the United States shall be employed on any such public works and that preference shall be given citizens of the state of New York." If this provision of law shall not be complied with the contract shall be void. Each contractor will be required to keep a list of his employees, in which it shall be set forth whether they are naturalized citizens or native born citizens of the United States, and such lists shall be open to the inspection of the commissioner of labor.

The work on the improvement of the canals is to be carried on in such a way that navigation upon the existing canals will not be closed during the period in which the work of improvement is in progress. During the months when the existing canals are open to navigation work will be carried on on such parts of the projected improved canals as deviate from the lines of the existing waterways. In the winter months, when the canals are closed to navigation, work will be pushed on those portions of the old canals which are to form a part of the improved canals. It is considered important that there should be no serious interruption of canal traffic during the time in which the improved canal is being constructed for the reason that there is believed to be an opportunity for a considerable increase in that traffic, even with the present facilities, owing to the fact that the railroads of the state have now increased the freight rates on grain to 4 cents a bushel, a rate which will permit of a fair profit on hauls over the canals. The cost per ton of transportation on the canal at present is 2.62 cents per bushel. It was when the railroads met this rate by a rate of 2.50 cents per bushel that canal commerce began to decline. From 6,000 boats in 1862, the number of the boats on the canals has steadily decreased until last year there were not more than 500. As the facilities for transportation on the canals decreased through their competition the railroads of the state began to put up their rates until now they have a rate of 4 cents a bushel.

Carefully made estimates show that the improved canals will enable 1,000-ton barges to carry freight at a profit, for a rate of fifty-two one-hundredths of a mill per ton mile, or 26.1 cents per ton, Buffalo to New York. It is claimed that the railroads will not be able to compete with this rate on heavy freights. The New York state canal committee, after a painstaking inquiry in this matter, reported that there was no probability of the railroads being able to carry freight at one mill per ton mile. It is asserted, therefore, that transportation by the 1,000-ton barge canal will be the means of abolishing the differentials in railroad freights

which have been responsible for the diversion of commerce from the state of New York and from the city of New York. The differentials now in effect against traffic to and from New York range from 20 cents to \$1.00 per ton, in favor of Philadelphia, Baltimore and Newport News.

The present canal boat has a capacity of 240 tons, or 8,000 bu. of wheat. The present maximum railroad train carries 2,700 tons, or 90,000 bu. of wheat. The canal boat capacity has practically not increased at all in twenty-five years, while the maximum railroad capacity has increased ninefold. The canals, in consequence, were practically driven out of competition with the railroads, and, according to a report made by the Chamber of Commerce of New York the result of railroad discrimination against the port of New York has been that during the twenty years from 1877 to 1897 there was a total decrease of the commerce to and from New York from 53.7 per cent. to 51 per cent., and an advance of all other ports from 46.3 per cent. to 49 per cent. This relative shrinkage has continued down to the present time. The annual report of the Chamber of Commerce of New York for the fiscal year ended June 30, 1902, shows that the total foreign commerce of New York city during the year ended June 30, 1902, suffered a decrease of \$43,198,321 as compared with the same period of the previous year, and \$23,756,248 as compared with the period ended June 30, 1900. Instead of sharing, according to its old-time ratio, in the growing commerce of the nation during the past nineteen years, it is estimated that the port of New York has fallen behind to the extent of \$300,000,000.

One effect of the construction of the 1,000-ton barge canal which those interested in canal navigation expect to see realized, is the restoring to the canals of the coal carrying trade to the northwest. It is coal and the heavier class of manufactured goods which it is believed will furnish the 1,000-ton barges with their return cargoes.

LAKE CARGO RECORDS.

The lake grain cargo record is again broken, this time by the Steel Corporation steamer Rensselaer, which delivered at Buffalo a few days ago from Chicago, 151,000 bu. of wheat, 94,000 bu. of barley and 55,155 bu. of oats, 300,155 bu. in all, footing up in weight 7,668 tons (2,000 lbs.) or 49 tons in excess of the cargo taken to Buffalo a couple of weeks ago by the steamer Mataafa. Among big loads of grain, other than those just referred to, recorded on the books of Brown & Co., vessel agents of Buffalo, are the following: S. J. Murphy, 269,000 bu. of corn (7,532 tons); John W. Gates, 250,000 bu. of wheat (7,500 tons); S. J. Murphy, 302,200 bu. of barley (7,252 tons); H. L. Shaw, 257,000 bu. of flax (7,196 tons); H. S. Holden, 362,000 bu. of oats (5,792 tons). Cargo records to date are:

Iron ore—Steamer Wm. Edenborn, owned by Pittsburg Steamship Co., A. B. Wolvin of Duluth, manager, 8,807 gross or 9,864 net tons, Escanaba to South Chicago.

Grain—Steamer Rensselaer, Pittsburg Steamship Co., A. B. Wolvin of Duluth, manager, 151,000 bu. of wheat, 94,000 bu. of barley and 55,155 bu. of oats (300,155 bu. in all), equal to 7,668 tons (2,000 lbs.), Chicago to Buffalo; steamer Mataafa, Pittsburg Steamship Co., A. B. Wolvin of Duluth, manager, 185,399 bu. of corn, 40,000 bu. of rye and 43,600 bu. of wheat (268,000 bu. in all), equal to 7,619 tons, Chicago to Buffalo; steamer S. J. Murphy, Pittsburg Steamship Co., A. B. Wolvin of Duluth, manager, 269,000 bu. of corn, equal to 7,532 tons, Chicago to Buffalo.

Coal—Steamer I. L. Ellwood, owned by Pittsburg Steamship Co., A. B. Wolvin of Duluth, manager, 7,688 net tons anthracite, Buffalo to Duluth; steamer John W. Gates, Pittsburg Steamship Co., A. B. Wolvin of Duluth, manager, 7,659 net tons of bituminous, Lorain to Duluth.

Especially aggravating was the attitude of the tugmen employed on the tugs in Cleveland during their recent strike. They left the tugs on a Saturday night without warning and had various reasons to offer for their action, the main one being that they were tired. It was specifically agreed upon when the contract was made last spring between the tugmen's union and the Great Lakes Towing Co. that any grievances should be submitted to arbitration and that the men should remain at work meanwhile. The men broke that clause by quitting work. That is the only clause in the whole agreement that affords any protection to the Great Lakes Towing Co. If the men don't want to respect it there is absolutely no sense in having any agreement with them at all. President Coulby finally succeeded in impressing that upon their minds and the men returned to work, pending adjustment. It appears that they claim not to have been paid for overtime. This, and other grievances of a minor character, are now being looked into.

Yachtsmen and lake seamen desirous of securing licenses as masters are to have an opportunity the coming winter of instruction in navigation and pilotage from a government expert. Lieut. W. J. Wilson, in charge of the hydrographic bureau in the Masonic Temple, Chicago, has taken charge of a class of twenty-five students from the Chicago fleet. The two great perils of lake navigation, fog and snow, will be given attention through a course on compass adjustment. Lieutenant Wilson will be assisted by John G. Kreer, a graduate of the Royal School of Naval Architecture, Germany.—Chicago Record-Herald.

A PLEA FOR WOMEN COOKS.

In presenting the letter published below in the vernacular in which it is written the Review does so because it loses none of its pathos by its illiteracy. It is a potent and powerful document, a pathetic evidence of the misery caused by the arbitrary dictates of the union. The letter reads:

"Editor Marine Review: i hardley know how to explaine or ask you good piple to intresede for us By Riteinge a Peace in yor M R. Meany of us have a hard time to make a livean since we war stoped from Cookinge on the lakes. Meany of us lost Our Dear husbands on theses Botes and now thay trye to take our meanes of suport away from us and our little ones. i myself have 5 chldrean. i lost my husband om lake sopeare 4 years ago. i tried to make a onesed liven and keepe my children to geather. i did till now. Oh if thoos rich men and Capt new how hard it is for a women to get along alone with the small wages in the citey. I can hearldy soport my self with out childrean. i put them in a inestoidgod. i would give you my name only i would Bring Down the Anger of some of my husbands piple if they saw it in preaint. if you can and will help us by Ritennge a Peace in the M.R. all i can give you is my preares. Pleas ask the firemen and engineers to live and let live. All we ask for is the small Botes or Barges. Helpe me."

The cooks' union is the weakest of all the unions. It is weak because the members of it are not all competent cooks and their services are consequently unsatisfactory to those who have to live on what they serve. The cooks recognize the inherent weakness of their union and are going to take steps this winter to remedy it. Before a cook can join the union they are going to insist that he shall be able to cook and that he shall not be merely a cook by courtesy. The agreement with the cooks' union made by the executive committee of the Lake Carriers' association last winter was merely one concerning wages. There is no specific agreement that none but union men shall be employed. The provision regarding tow barges reads: "Cooks on tow barges shall receive the same wages as the seamen on the same barges."

As a rule whenever the question concerning the women has arisen it has been the policy to leave it to the crew. If a protest was made by the cooks' union and supported by the crew the women have had to go; but if the protest was not supported by the crew the women were retained. The cooks' union is not in close affiliation with the other unions and is not especially supported by them, as many of its members are undesirable from the standpoint of efficiency. It would seem indeed as though the women, especially those in such circumstances as the writer of the letter above, might be permitted to serve as cooks on the barges. A woman who has suffered as she has suffered, and whose hard position is directly the result of having followed a lake career faithfully, is morally deserving of protection.

NEW MANAGER OF SHIP OWNERS' WORKS.

Robert J. Dunham of Chicago, who was recently elected president and general manager of the Ship Owners' Dry Dock Co. of that city to succeed Chas. A. Mac Donald, retired, is already getting around to see vessel owners in different parts of the lakes, giving evidence of a thorough interest in his new position. The election of Mr. Dunham to this place should prove of advantage to the stockholders of the company. It can certainly be said of him that he is energetic and ambitious. He is a young man but his training from boyhood has been entirely in vessel lines. The Ship Owner's works is not large and Mr. Dunham's new position is not a great one as positions go in industrial lines these days, but he undoubtedly thinks it big enough to require constant attention and in that respect especially his selection for the place is generally looked upon with favor.

CANADIAN MARITIME NOTES.

Capt. Noll of Victoria, B. C., is organizing a company to build a 1,000-ton steamer with accommodation for a large number of passengers to trade between Victoria and northern British Columbia ports.

The Polson Iron Works, Toronto, is building an 80-ft. steamer for service on the Mackenzie river. She will be sent in sections to Alubasca Landing, for the opening of navigation in the spring.

The Wolfe Island (Ont.) township council has entered into a contract with the Bertram Engine Works Co., Toronto, to construct a ferry steamer at a cost of \$25,000.

The Lurcher, first of the two lightships under construction at the Polson Iron Works, Toronto, for the Dominion government, has been launched.

There has been launched at the Spencers Island Ship Building Co.'s works the hull of a tug for John E. Moore, to be named the Lord Dundonald. Her dimensions are: Length, 88½ ft.; breadth, 19½ ft.; depth of hold, 9½ ft. The St. John Iron Works is fitting the machinery.

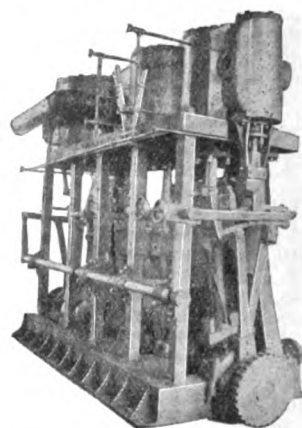
The question of increased wharf accommodation at St. John, N. B., is being considered by the C. P. R. authorities and the local authorities. The present accommodation is insufficient to meet the requirements of the C. P. R. for its steamship service and the demands of other steamship companies.

Montreal harbor commissioners are considering and reconsidering the plans for the proposed sheds on the new wharves. The commissioners appear to be consistent in one thing only, and that is their indecision. At one meeting a certain plan is

adopted and at the next it is turned down and some other proposition is favored. This indecision has resulted in a lot of harm to the development of Montreal harbor.

MARINE ENGINE FOR PACIFIC COAST TRADE.

Charles P. Willard & Co. of Chicago have recently built and delivered a marine engine, illustrated in the accompanying photograph, for Pacific Coast passenger trade. The cylinders are 14 in., 21½ in. and 34 in. in diameter by a common stroke of 18 in., designed for a working pressure of 250 lbs. The engine is built on the open-frame slipper-guide system and is intended to indicate 250 H. P. at 200 revolutions per minute. The engine weighs 14 tons and is equipped with double-ported piston balance valves with metallic rings in the piston valves. The high-pressure cylinder has an independent cut-off, as shown. The crank shaft is of solid forged steel 7½ in. in diameter, all in one piece, and accurately turned, having steam reversing gear with oil controllers. The links are of the Stephenson type with forked upper end connecting rod and cast steel cross head, with bronze gibs in the rear of cross head.



AROUND THE GREAT LAKES.

What is known as the Fontana collision case, long in court, is not yet settled.

John McDougal, a retired lake captain, seventy-four years of age, was drowned in Niagara river Monday.

The steamer City of Grand Rapids was sold at marshal's sale at Buffalo last week to John T. Mahany for \$550.

In an endeavor to enter the Duluth canal in a storm Monday the schooner Thomas Gawn struck a pier and broke her bow badly.

J. C. Gilchrist of Cleveland has libeled the steamer William S. Mack for \$13,000 as a result of a collision with the City of Rome off Bar point last July.

Another of the car ferry steamers for the Pere Marquette company building at the Cleveland yard of the American Ship Building Co. will be launched Saturday.

Capt. Charles Stickney, one of the oldest tugmen at the port of Cleveland, died at Dunkirk last week. The remains were brought to Cleveland for interment.

The Buffalo Dredging Co. has decided to lay up its dredges for the season as a result of seventy of its dredgemen striking for full time when they reported for duty each day.

The steamer Western Star, which was recently launched at Detroit, has been placed in winter quarters owing to her inability to get a cargo. This illustrates clearly the scarcity of freight outside of that covered by contract tonnage.

The Goodrich Line passenger steamer Iowa was carried against the south pier at Racine last week while entering port during a storm and a hole 10 ft. long was torn in her side. The bursting of a steam pipe at the same time caused consternation among the few passengers.

Mr. A. A. Schantz has been appointed general superintendent and traffic manager of the Detroit & Cleveland Line and also of the Detroit & Buffalo and Cleveland & Toledo lines. Mr. Schantz has been identified with the passenger traffic of the great lakes for twenty years and through competent work has steadily advanced.

The passenger steamer Atlantic was totally destroyed by fire in Georgian bay this week. As the sea was quiet the passengers and crew were enabled to embark in the small boats and row to Parry Sound. The utmost coolness was exhibited by all concerned. The Atlantic was owned by the Northern Navigation Co. of Collinwood.

About Nov. 13 the light at South Haven, Mich., on the outer end of the south pier will be shown from the recently-erected metal tower, without change in characteristic or location. The height of the light will be increased to 36 ft. above mean lake level. The tower is white, conical, and is surmounted by a black lantern deck and lantern.

An Ottawa dispatch says that the government authorities have decided upon plans to materially increase the usefulness of Port Colborne harbor. The port at the end of the Welland canal will be given a uniform harbor of 22 ft., the deepened district to extend from the lake to the locks. The plan includes the removal and rebuilding of the piers protecting the harbor.

Wreckers are having hard work in releasing the steamer Walter L. Frost ashore on South Manitou island. They scuttled the vessel to prevent her being pounded to pieces and then pumped the water out of her. They had about released her when the wind freshened and shortly began blowing half a gale

with the result that the vessel had to be scuttled again. Finally all attempts to save her had to be abandoned.

Owing to the widening of the Lime-Kiln crossing, Detroit river, a change has been made in location of the small light-vessels that mark the cut. The south light-vessel, No. 64, has been placed to mark the elbow made by Bois Blanc channel with the Lime-Kiln crossing channel, and the north light-vessel, No. 65, has been placed so as to mark the elbow made by the Lime-Kiln crossing channel with Ballard reef channel.

A writ of certiorari has been filed in the supreme court at Washington on behalf of H. W. Watson, owner of the steamer Inter Ocean, against the St. Clair Steamship Co., owner of the schooner Fontana, and the Boston Coal Dock & Wharf Co., owner of the schooner Santiago. The Fontana was sunk near Port Huron, Aug. 3, 1900, as a result of collision with the Santiago. The Inter Ocean is charged with having contributed to the accident.

Mr. W. H. Becker of Cleveland, manager of the Inland Transportation Co., has sent a check to Capt. James Jackson, master of the steamer Yale for the heroism displayed by him in standing by the steamer W. F. Sauber in the gale on Lake Superior recently. The Yale rescued the entire crew of the Sauber with the exception of Capt. Morris and Frank Robinson, an oiler. Capt. Morris went down with the ship and Robinson was lost after he entered the yawl.

The Canadian steamer Tecumseh, bound up with coal, struck the steamer Lily, bound down light, last week near Bar point lightship. The captain of the Tecumseh says that the Lily tried to cross his bows. The master of the Lily says that he was on the proper side of the channel and, thinking everything would be all right, did not blow passing signals. The Lily was put in dry dock at Detroit as her injuries are of a serious character. The Tecumseh's stem was broken.

At the south yard of the Milwaukee Dry Dock Co. the work of giving 60 ft. width of gate to one of the company's docks has been completed, so that it will now accommodate any of the car ferries. At Cleveland the American Ship Building Co., which controls the Milwaukee works, also has completed important dock improvements. Dry dock No. 1 at the foot of Weddell street is now 547 ft. by 65 ft. by 15 ft. 6 in. and dry dock No. 2 at the same point is 450 by 50 by 16 ft.

The wisdom of stationing tugs at the St. Clair Flats ship canal and compelling vessel men to use in passing the wreck of the Glidden was well exemplified last week when three steamers met in the channel. The tug embargo had been lifted by Maj. Bixby, and the T. W. Palmer and Mather attempted to go up while the Wells attempted to go down. The result was a very bad mix-up, the Mather hitting the west bank of the canal and the Wells smashing into the Glidden. It was simply a miracle that the effects of the collision were not worse than they were.

'Tis an ill wind, indeed, that blows no one good. The wreck of the Glidden on the St. Clair Flats ship canal blew \$67,000 into the coffers of the towing companies. The steamers were compelled to use one tug on the up passage and two tugs on the down passage and the towing companies charged \$25 for each tow. Some noise was made about this by vessel owners publicly; but privately they regarded the rule as a wise one. Maj. Bixby, government engineer, would have been blamed if a collision, blocking navigation had occurred in the channel for want of a tug.

At the annual meeting of the stockholders of the Great Lakes Engineering Works held in Detroit last week the following directors were elected: Antonio C. Pessano, Detroit; George H. Russel, Detroit; William K. Bixby, St. Louis; Henry C. Potter, Detroit; Joseph K. Boyer, Detroit; John A. Penton, Detroit; O. P. Letchworth, Buffalo; H. W. Hoyt, Chicago; John R. Russel, Detroit. The directors elected Antonio C. Pessano president and general manager, George H. Russel vice president, and John H. Russel secretary and treasurer. An inspection was made of the plant by the directors and the announcement made that the firm has work enough ahead to keep it busy for eighteen months.

The barge A. T. Bliss went to the bottom in a storm off Ludington last week. Her crew of two men were rescued by the life-savers with the assistance of the big car ferry Pere Marquette No. 18. The Bliss started in tow of the tug Sydney Smith from Sturgeon bay with a load of stone for Ludington. Half way across the lake the Bliss broke away in the storm and the seas were so high that the tug could not pick her up again. The tug thereupon made for Ludington and reported the Bliss's plight to the life-saving station. Capt. Weckler of the life-saving crew pressed the car ferry into service and picked off the men in the surf boat. They were aided in doing this by the car ferry acting as a break to windward and playing its searchlight upon the barge. The Bliss was owned by the Sturgeon Bay Stone Co. and was worth \$6,000.

ELECTRICALLY DRIVEN ELEVATOR DREDGES.

The Review of Oct. 22 contained an article by A. F. Smulders of Rotterdam, descriptive of an elevator bucket or ladder dredge in which stress was laid on the fact that the dredge is electrically-driven throughout and supplied with current from a power house on shore. Mr. J. S. Miller of South Milwaukee, Wis., home of the Bucyrus Co. of dredge-building fame, suggests in a letter to the Review regarding this article that if the dredge referred to is to be taken as a great achievement on the other

side it will not be necessary for the United States to go to Holland to learn about elevator dredges. "The Bucyrus Co. has," he says, "for the past nine years been building this type of dredge, for placer mining principally, and anything but an entirely electrically-driven dredge is a rarity. The current is supplied from power houses on shore. Not only this, but the bucket chain referred to in the article is a thing of the past in this country. What is called the continuous bucket chain with a bucket shell on every link is now almost exclusively used. In the Feather river district near Oroville, Cal., they are operating electrically-driven elevator dredges digging to a depth of 40 ft. and will soon have two digging to a depth of 60 ft. below water level. In the matter of spuds there are also decided improvements in the way of handling over those referred to in the article."

ITEMS OF GENERAL INTEREST.

The steamer Lewis Luckenbach, built at the Roach yards, Chester, is almost ready to go into service. She will be commanded by Capt. Peck.

The solid and sectional improved semi-steel propeller wheels being made by the Great Lakes Engineering Works, Detroit, are meeting with great favor and numerous orders for lake and ocean steamers are being filled.

R. A. Perry & Co. of San Francisco, who have the contract for constructing a deep-water channel at Houston, will establish a ship yard there for the construction of scows and barges to be used in the work.

At the Jackson & Sharp company's yard, Wilmington, four barges now in frames are on the ways and work on them is being hurried. The barge Christiana is just off the marine railway, after having been sheathed with galvanized iron for the winter.

At the meeting of the American Society of Mechanical Engineers to be held in New York in December the nominating committee has decided to present the name of Ambrose Swasey of Cleveland for president. As there are no other nominations Mr. Swasey will undoubtedly be the next president of the society.

A bill has just been introduced in congress to provide for the construction of a ship-canal through the states of Delaware and Maryland to connect the Chesapeake and Delaware bays at a cost of \$10,000,000. It is proposed that the canal be made 100 ft. wide and of sufficient depth to enable vessels drawing 23 ft. to utilize it.

At the meeting of the Naval Order, held in New York last week, the following officers were elected: Commander, Admiral Frederick Rodgers; Vice-Commander, Capt. Jacob W. Miller; recorder, Clinton E. Drane; treasurer, Allen S. Appar; historian, W. T. Salters; registrar, W. S. Wells; council, Lieut. Comdr S. Hubbard, Ernest Carter, John Wright, George H. Butler, George de Forest Barton, Jarvis D. Edson, William H. Dimock and Edward Penchard.

In view of the prominence that was given, through Democratic endeavor, to the national issue of ship subsidies in the Ohio campaign, the sweeping victory for Republicanism in that state may be taken as indisputable evidence that the great majority of Ohio people endorse Senator Hanna's record on the ship subsidy question and want him to continue his efforts to gain for our almost-vanished merchant marine the aid which it needs to become a quantity commensurate with the commercial greatness of the United States.—Albany Evening Journal.

More reports come from France of very satisfactory trials of naval vessels fitted with Belleville boilers of the economizer kind. The cruiser Desaix of 17,000 H. P. was given a consumption test of six hours at Cherbourg recently and at 13,671 H. P. the consumption of fuel was 738 grammes with a combustion of 102 kilos per square meter of grate per hour. In another six-hours test the Admiral Aube, a protected cruiser of 20,000 H. P., showed at 2,173 H. P. a consumption of only 527 grammes per horse power per hour with a combustion of 46 kilos per square meter of grate per hour.

Judge Morrow in the United States circuit court, San Francisco, has made a ruling that while the Union Iron Works must be considered part of the assets of the United States Ship Building Co. and that the title to it at present is vested in the receiver, James Smith, Jr., the property must be held intact in order that it may carry out its government and private contracts and carry on its usual business. A further ruling was that the works may legally be permitted to borrow money. The order was made on the application of the Union Iron Works to borrow \$200,000 to pay its employees and to meet other expenses. The local banks declined to make the loan until a judicial ruling had been made in the matter.

Among vessels recently classed and rated by the American Bureau of Shipping, New York, in the Record of American and Foreign Shipping are the following: American screw Araness; American schooners Chas. K. Schull, Edith & May, Marjory Brown, Wm. C. Tanner, Pendleton Bros., Robert H. McCurdy, Wm. K. Park; American barkentine Ethel V. Boynton; American bark James A. Wright; American three-masted schooners Marian, Willie B. Newton, Arthur V. S. Woodruff, E. Marie Brown, Edward H. Blake, Chas. H. Valentine, Harry W. Haynes, Willie H. Child; American barges C. R. R. of N. J. No. 2, J. Carlton Hudson; British barkentine Milton; British schooner Nevis; British three-masted schooners Ronald, E. M. Roberts, Adonis, Bluenese, Maritana; British bark J. H. Bowers.

SEEN AND HEARD ON THE LOOKOUT.

Two inglorious defeats have aroused a feeling of determination among St. John, (N. B.) yachtsmen to lift the Thomson cup. The international races off Sandy Hook were so absorbingly interesting that the troubles of the Canadian yacht enthusiasts have hardly been noticed along the American shore. It appears that two years ago Commodore Thomson presented a cup to a St. John yacht club to be sailed for by any club in the Dominion. The first race was won by a freak boat from Sydney called the Cibou, and the regret felt upon seeing the cup leave St. John after the first race was intensified on account of the ease with which the outsider gained the victory. Last summer, shortly before the time set for the second race, one of the club's members bought a Sydney yacht. He manned her with a crew of St. John men but was unsuccessful in his attempts to lower the Cibou's colors. The latter boat still holds the cup. Now a few members of the St. John club have formed themselves into a syndicate to build a boat that has a chance to beat the Cibou or any other freak of her ilk. A successful yacht designer has been given orders for a hull 42 ft. over all, 21 ft. water line and 9 ft. beam. Incidentally it may be observed that as the design calls for a craft drawing scarcely 6 in. the St. John yachtsmen should refrain from speaking of their opponents' boats as freaks. While the Canadian who tells me of this contest says that the prospective cup lifter will be sloop rigged, the unusual forward position of her mast gives the boat the appearance of a catboat. She will carry only one jib, and taking into consideration the afore mentioned forward location of the mast, and the fact that the jib stay is 1 ft. abaft the nose, the jib must necessarily be very small. Though without a great deal of experience as losers of yacht races Americans can still sympathize with the less-fortunate St. John sportsmen. May their shallow-draught boat answer the purpose for which these Bay of Fundy men intended her.

As regards the arrangement of cabins and quarters for the crew, the numerous tramp steamers seen at our seaboard ports are generally very much alike. It is therefore not surprising that considerable interest was shown upon the arrival in Boston recently of the steamer Dominion—interest due, no doubt, to the fact that this vessel's builders had departed from the usual manner of housing the crew. Capt. Dawson and his officers occupy a cabin amidships—the whole affair being above deck, and the machinery as well as the quarters of engineers and crew are located in the after part of the ship. Excepting, therefore, the room taken up—about 70 ft. forward of the stern—by engines and boilers the hull of this steamer is all cargo space. Built last spring at New-castle by Swan & Hunter, with a registered tonnage of 2,583, the Dominion has seventeen derricks and ten steam winches. Chartered for a term of years to the Dominion Coal Co., this steamer recently discharged 6,000 tons of coal in 9 hours, and as, thanks to her numerous hatches, she can be as speedily loaded, her earning capacity must be superior to that of the vessels formerly in this trade. The seventeen derricks serve also as ventilators, which may be regarded as an improvement on the old-style coal carriers. The Dominion, as regards usefulness may be considered a success, but she is far from ornamental. Her smokestack, necessarily placed well aft, towers higher up in the air than her three puny-looking masts. But whatever may be the opinion of lovers of the beautiful in naval architecture the quarters of both officers and men are really comfortable. As her skipper Capt. Dawson, says, "she was built not only to carry an immense load of coal, but also to discharge her load in an incredibly short time"—and her recent performances have shown her ability to do so.

A writer in a German magazine declares that "the only things forever modish are youth, money and death." Now while some of us may regret that, for instance, poverty or old age may never become the rage, sensible people unanimously hope that the increasing tendency of late among foolhardy lone-mariners to cross the ocean in open boats may never become the fashion. This is apropos of the achievement of Capt. Ludwig Eisenbraun who lately arrived at Madeira from Boston in a 17-ft. dory. That Capt. Eisenbraun is a capable seaman all his friends in Boston and Gloucester knew, while of the dory's fame as a reliable boat on rough water multitudes of persons who never heard of this captain are aware. According to his own report, he was nearly swamped during an August storm and yet Capt. Eisenbraun has only demonstrated that one may possibly succeed in crossing the Atlantic in an open boat. This having been proved before, matter of fact people earnestly advise this lone-mariner to make use of the regular ferry boats when intending to return. Doing so he will reach here a few days after embarking, instead of traveling at the rate of 2 miles an hour as upon his eastern trip. The only sensible "lone-hand" voyager ever heard from was Capt. Slocum. Commencing his travels in a 28-ft. sloop this experienced sailor converted her into a yawl, and thus rigged was able to meet any reasonably-bad weather without having incessantly to fear destruction.

F. H.

Information from Washington is to the effect that no attempt will be made to pass a shipping bill at the forthcoming session of congress. The bill will undoubtedly be introduced but it appears to be the understanding not to attempt to bring it to an issue until after the presidential election.

OHIO INDORSES SHIP-SUBSIDIES.

New York Commercial.

Not a man who voted in Ohio on Tuesday last failed to understand that, if a Republican legislature was elected, Senator Hanna would be returned to the United States senate, and that, if he should be returned, he would resume his persistent, aggressive and forceful advocacy of subsidies for American shipping in the foreign trade. The Ohio Republican platform declared for legislation for an American mercantile marine. Senator Hanna in the opening speech of the campaign stated with all of the emphasis of which he was capable that he had worked and voted for a ship subsidy bill during his services in the United States senate and that, if he were returned, he would continue to work and vote for ship subsidy bills. He distinctly said that he wished no one to misunderstand his position on that question.

His Democratic opponents took him at his word. Senator Hanna was made the chief object of attack by the Democrats during the entire campaign, and his record on the ship subsidy question was the issue. Tom Johnson attacked him, and so did John H. Clarke, who was the recognized Democratic candidate to succeed Senator Hanna in the United States senate. In every opposing speech that was made Senator Hanna's advocacy of subsidies for American shipping was referred to, and the Democratic press of Ohio was filled with articles attacking ship subsidies in general and Senator Hanna in particular.

Senator Hanna never for one moment flinched. He met the torrent of abuse and misrepresentation with repeated statements of fact that sunk deep into the minds of Ohio's voters. He explained that American shipping in the foreign trade is unprotected; that as a result it had declined from 2,500,000 tons in 1861 to 873,000 tons in 1902; that from carrying 65 per cent. of our foreign commerce in 1861 we had fallen to the carrying of a paltry 9 per cent. in 1902; that American ships cost more to build and to run than foreign ships do; that the difference in the cost of construction and operation is the difference in the wages paid to American workmen in the building and running of American ships; and that he desired protection for American shipping equal to that enjoyed by other American industries that are subject to foreign competition.

As a result of this discussion, Ohio elected 118 Republicans and twenty-five Democrats to the state legislature. When the time comes to elect his successor, Senator Hanna will receive 118 votes and John H. Clarke, who attacked ship subsidies up and down and across the state of Ohio and who assailed Senator Hanna's record thereon, will receive twenty-five votes. Senator Hanna will return to the United States senate for another term of six years with a majority of ninety-three members of his state legislature. Six years ago there was a majority of but one in the Ohio legislature that elected Senator Hanna to the United States senate. Now there is a majority of ninety-three! No one can hereafter say that Senator Hanna does not represent the people of his own state when he votes for subsidies.

With ship subsidies as an issue that overshadowed all others in the Ohio campaign, with Ohio's favorite son so magnificently indorsed in his advocacy of ship subsidies by the electorate of Ohio, no wonder the militant friends of American shipping feel renewed courage and unbounded hope that their great industry will yet be justly protected.

WE MUST HAVE SHIPS.

At Hamburg, Germany, last year, the registered tonnage of ships of all nations was 8,699,000 tons. About 53 per cent. of this shipping was under the German flag and 36 per cent. under the British flag. The insignificant total tonnage under the American flag was 2,147 tons. Only one ship visiting the port during the year bore the American flag. American flags are not often enough seen on the seas for the sailors of other countries to become acquainted with them. American pride as well as business enterprise ought to demand a speedy change in this direction. American goods should follow the flag in American vessels.—Norwich (Conn.) Bulletin.

Mr. McKinley, in his last speech, spoke in tones of warning to the American producer of every stamp and kind that the question of the hour was how to secure wider and greater markets. The one point of view from which America is weak and contemptible in the eyes of all the world is on the subject of our merchant marine. The American flag may be seen in hundreds and thousands of places on the land of the United Kingdom and upon the continent. It flies over great depots of manufactured goods and it flies in every direction on fete days, and is recognized with respect, and even awe, by the nations of the world, but it does not float on the water. In the fiscal year of 1902 the total exports to Europe amounted in value to \$997,614,762—almost a billion of dollars—we sent abroad of the products of American industry. Of that enormous sum 1¼ per cent. was carried in American vessels and 98¼ per cent. was carried in the ships of other countries.—General C. H. Grosvenor.

When American goods are carried in American ships from the original port of shipment to the final port of destination, our export records will give us a true index of our foreign trade.

Owing to the absence of direct steam communication between the United States and Liberia the trade between the two countries is practically nil as compared with the trade between Liberia and Great Britain, Germany, France and Holland.

WALTER J. BALLARD.

ADMIRAL BRADFORD'S ANNUAL REPORT.

Rear Admiral R. B. Bradford, chief of the bureau of equipment, navy department, in his annual report to Secretary Moody, draws attention to the inefficiency of the system of coal depots for naval use in foreign waters, which subject is not discussed owing to diplomatic considerations. It is stated, however, that no progress has been made during the past year towards increasing the number of stations. In connection with the subject two maps of the world are submitted, the first showing the coal depots built, building or projected by the United States, and the second giving similar information concerning Great Britain. Rear Admiral Bradford directs attention to the maps and adds that "a comparison of the two is instructive."

Coal purchased for steaming purposes during the year amounted to 487,036 tons, costing \$2,435,168.37, an average of \$5 per ton, or 16 per cent. less a ton than during the preceding year. The bureau has made agreements in sixty-six foreign ports to supply ships of the navy with coal at less than current rates.

Attention is called to the great importance of hydrographic surveys in the Pacific ocean, in order that the large number of imperfectly-known dangers to navigation may be definitely located, or, if non-existing, erased from the charts. In reference to the Philippines it is said that with the exception of the portions of that archipelago which have been surveyed since its occupation by the United States, an insignificant fraction of its entire area, there is scarcely a mile of water expanse so charted that it may be navigated with complete confidence. The suggestion is made that in future these surveys be prosecuted with vigor.

The bureau reports that the commission appointed to consider the question of transferring to the department of commerce and labor the hydrographic office, the naval observatory and the nautical almanac office has reached the conclusion that it would be unwise to transfer these offices from the jurisdiction of the navy department, on account of their nautical character and their indispensable aid in preparing for war. The bureau says it learns that it is proposed to place these offices under civilian control and attach them to the secretary's office, and adds: "The reasons assigned for their retention in the navy department would appear to be equally good for retention under the administration of a sea-going combatant officer."

Admiral Bradford devotes one of the longest chapters of his report to an earnest defense of the integrity of the equipment bureau, the existence of which he declares is threatened by the aggressiveness of other bureaus. Therefore he presents an extended argument embodying quotations from various secretaries of the navy and other authorities to show that it would be very unwise to disturb the present organization, and he refers with some bitterness to the promotion of efforts to do away with the bureau.

Concerning an organization of sea-going officers of superior rank to advise the secretary of the navy on professional matters, which has been advocated for a number of years, Rear Admiral Bradford says it is not material by what name the organization is known, but suggests that "admiralty staff" seems appropriate. He says that it should not be so large as to be unwieldy, and that probably five members, with a corps of assistants would be sufficient, and that its duties should be clearly defined and advisory only. It is declared that the usefulness and success of such an organization depends absolutely upon its entire separation from the bureaus, and that no bureau chief should be a member. The bureau recommends such a body to be created by executive authority, and the members named in the same manner.

Admiral Bradford says that after an experience of six years in the department he believes that it is the administration of the department that needs attention, rather than its organization, particularly in the direction of expenditure of money, and in confining the subordinates of the department to their legitimate duties.

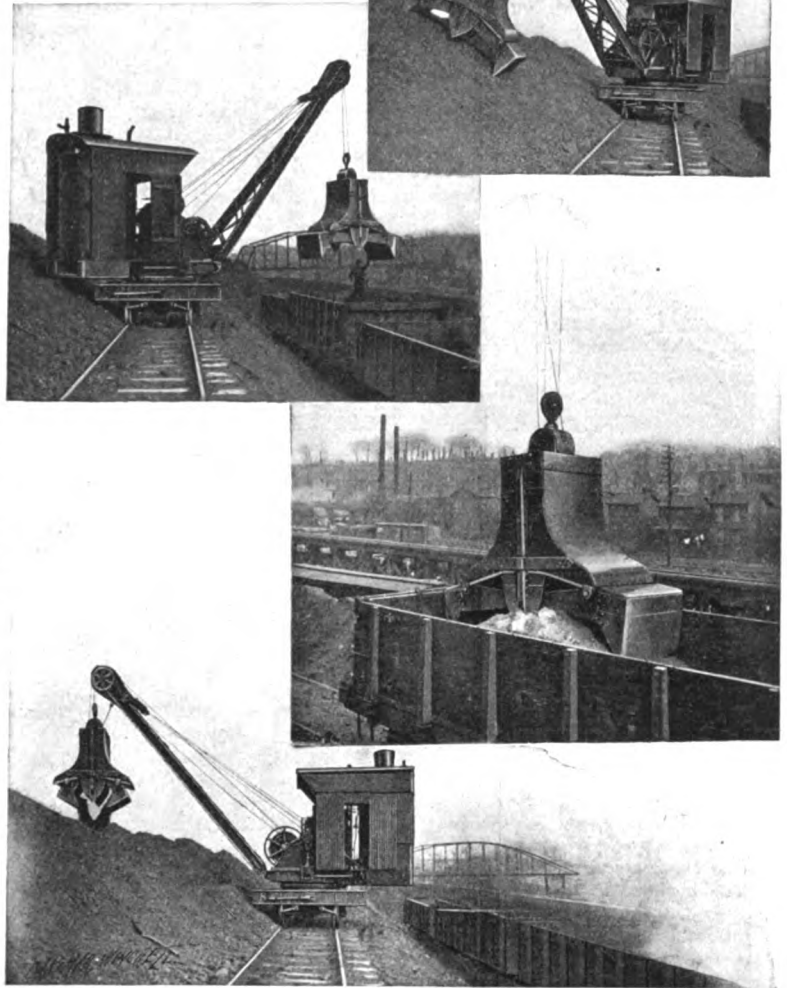
Admiral Bradford says it is a matter of congratulation that an efficient trans-Pacific cable is in operation from San Francisco to Manila with relay stations located only on American territory, and he adds that the relations between the department and the cable company are very satisfactory. The bureau invites attention to the necessity of providing means of defense at the three intermediate cable stations between the eastern and western possessions of the United States, namely, at Honolulu, Midway islands and the Island of Guam.

Reviewing the work of the hydrographic office, Admiral Bradford invites attention to the fact that the work of the hydrographic office in connection with the supply of charts, sailing directions and other hydrographic information to naval ships is distinctly a military function. It is, therefore, obviously essential, he says, that it should be under the control of a military department.

Last week the Northumberland Ship Building Co., Ltd., Howdon-on-Tyne, launched a steamer to the order of the Manchester Liners, Ltd., Manchester, for their Philadelphia and Manchester service. The vessel is of the spar deck type, 373 ft. over all, 48 ft. beam and 30 ft. deep. She has been constructed on finely-molded lines and the machinery has been designed for exceptionally heavy service on the Atlantic. The vessel will carry 7,000 tons dead weight.

BROWNHOIST LOCOMOTIVE CRANES.

On this page and the page following are some pictures of cranes made by the Brown Hoisting Machinery Co. of Cleveland. The group of views on this page show an entirely new application of the Brownhoist 10-ton locomotive crane. This crane is used for handling ore at McKeesport works of the United States Steel Corporation. It is standard gauge, with 30-ft. boom and two-rope grab bucket of 22-ft. cubic capacity. Since the introduction of the Brown patent grab bucket a large demand has arisen for locomotive cranes equipped in this way, for handling iron ore. Many of these cranes



Brownhoist Locomotive Crane Handling Iron Ore.

have been furnished to the largest steel plants in the country. The fact that this machinery combines the flexibility of a locomotive crane with the ability to automatically shovel and rehandle iron ore has already made it a factor of great importance from the view-point of the economies of steel production. In the other view 10-ton electric locomotive cranes are shown. This is another instance of the present tendency in large works to supersede steam by electric power.

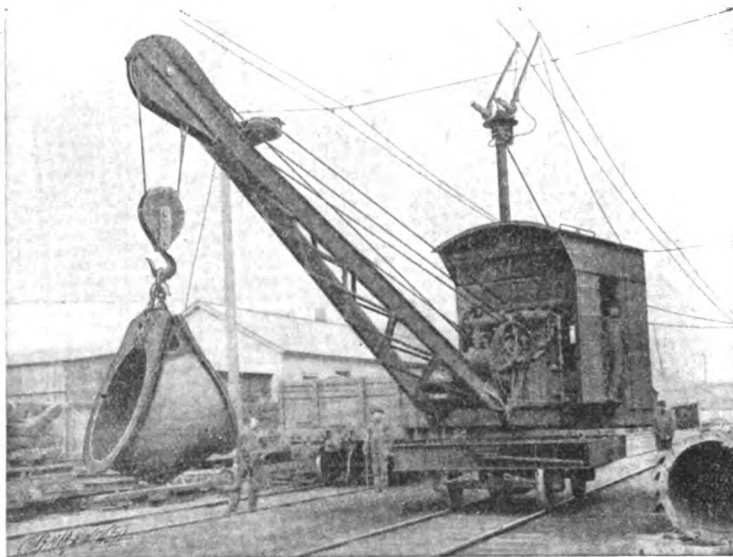
The Brown company recently issued a very neat pamphlet entitled "Brownhoist Locomotive Cranes." It is descriptive of the different makes of cranes of this kind and contains illustrations showing the machines as used in steel works, by bridge builders and contractors for large harbor works, in logging operations, on large sugar plantations, in stone yards and in canal construction, as applied to wrecking operations, for coaling locomotives and for unloading railway cars, etc., etc.

In the long list of large industrial concerns in this country and in Europe that are using Brownhoist cranes of one kind and another it is noted that the Carnegie works of the Steel Corporation has forty, Cramp ship yard six, Pennsylvania Steel Co. four, Pencoyd Iron Works seven, Lorain and Johnstown works of the Steel Corporation thirteen, National Tube Works six, Chicago plant of the Steel Corporation three, Newport News ship yard three.

The trial of the Chinook, recently converted from the transport Grant into a dredger at the Mare Island navy yard, has proved entirely satisfactory. At a depth of 55 ft., with her pumps working at full capacity, the full area of the 20-in. discharge pipe was employed without the slightest hitch.

COMMERCE OF THE PORT OF MONTREAL.

The port of Montreal, which will be closed to commerce within the next three weeks, has up to Nov. 1 surpassed all previous records. This applies equally to the passenger and freight trade. This is the more remarkable as the trade in the Atlantic ports of the United States seems to have fallen off in the same period. There are still a number of ships to clear before the close of navigation so that a great deal of freight has still to be moved. The increase of freight has not taken place in every line, however, for wheat shows a considerable falling off. Still it is expected that cargoes of wheat coming down the lakes



Brownhoist 10-Ton Electric Locomotive Crane.

rapidly will almost make up the deficiency which exists between this season's shipments and those of the year preceding. Up to Nov. 1, 736 seagoing vessels were entered in the harbor of Montreal as against 685 at the same date last year and 758 for the whole season of 1902. Besides this the tonnage has increased perceptibly as the ships are getting larger each year.

The Montreal Board of Trade publishes tables showing increases in exports to Nov. 1 of this year as compared with the same date a year ago. Among the items are 6,202,014 bu. of corn, compared with 108,560 bu. in 1902; 13,598,395 bu. of wheat, compared with 15,293,916 bu.; 887,328 bbls. of flour compared with 559,685 bbls.; 2,043,310 boxes of cheese, compared with 1,818,904 boxes; 395,506 bbls. of apples, compared with 293,160 bbls.; 132,551 head of cattle, compared with 63,484 head.

The largest single increase is in corn. Cattle, too, show a notable increase, due largely to the embargo on account of the foot and mouth disease in the New England states. Flour shows a marked advance. This is explained by the fact that when wheat was hard to get for shipment the millers had lots of it, and found it paid better to grind than to ship it in grain. The opening up of the South African and other markets for flour also contributed to the increase. The apple trade is also proving one of the surprises of the year. On account of a partial failure of the crop in Europe Canadian apples are finding a ready market on the other side. Record cargoes are being taken over. The Dominion steamship Canada, which left last Saturday, took over 24,000 bbls., while the Allan liner Bavarian carried 23,000 on her last trip. The shipments of apples from the present date to the closing of navigation promises to be something enormous, as space is being booked daily for large consignments.

The passenger trade, too, is a matter for congratulation to the steamship men who have their headquarters in Montreal. The westward-bound steamers of the Allan, Canadian Pacific and Dominion lines have carried larger numbers than ever before. Another difference in the trade is that while formerly half, if not three-quarters, of the passengers were bound for points in the United States, especially among the class of passengers then known as steerage passengers, at the present time the proportion crossing the boundary is reduced to one-third, or probably nearer to one-fourth. Taking the Allan line first, that company's ships carried out in 1901 14,940 passengers of all classes. In 1902 they carried 2,145 first-class, 3,965 second-class and 13,741 third-class passengers in their Liverpool-Montreal boats. Up to Nov. 1 this year, on the same service, they have brought out 2,610 first-class, 5,775 second-class and 15,815 third-class passengers, a total of 24,200 of all classes, as compared with 19,851 in 1902. The eastbound service on the same line shows that the steamers from Montreal to Liverpool took out in 1901 5,987 passengers of all classes, in 1902 6,474, while the figures up to Nov. 1, 1903, are 6,940. All the other lines show proportional increases so that the passenger trade of 1903 has been very heavy.

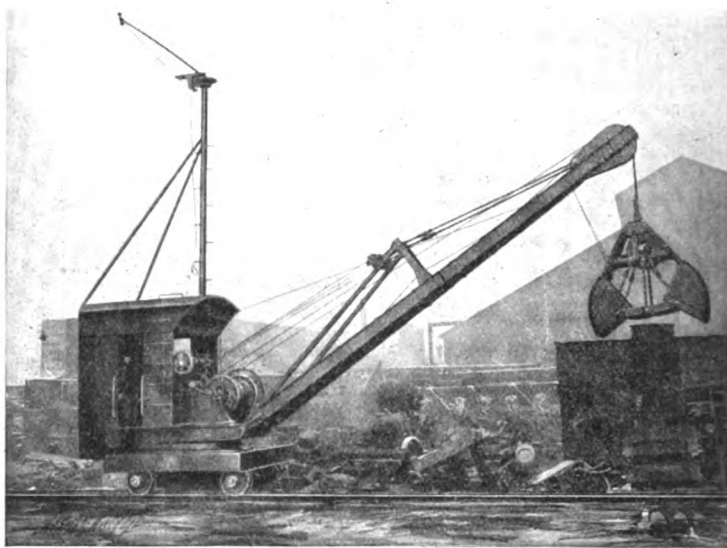
HISTORY OF THE ANCHOR.

The ships' anchors in general use up to the beginning of the last century consisted of a long, round iron shank, having two comparatively short straight arms, or flukes, inclined to the shank at an angle of about 40°, and meeting it in a somewhat sharp point at the crown. In large anchors the bulky wooden stock was built up of several pieces, hooped together, the whole tapering outward to the ends, especially on the aft or cable side. About the beginning of the last century a clerk in the Plymouth naval yard, Pering, by name, suggested certain improvements, the most important of which was making the arms curved instead of straight.

At first sight this simple change may seem of little value, but consideration will show that this is not the case. The holding power of an anchor depends on two principal conditions, namely, the extent of useful holding surface, and the amount of vertical penetration. The latter quality is necessary on account of the nature of ordinary sea bottoms, the surface layers of which are generally less tenacious and resisting than is the ground a short distance below.

In the year 1831 chain cables began to supersede the hempen ones, with the result that the long shanked anchors hitherto in vogue were no longer necessary, and anchors with shorter shanks and with heavier and stronger crowns gradually came into use. In consequence of these changes, a commission was appointed in the year 1838 to inquire into the holding power of anchors, and a principal result of its labors was the adoption of the so-called admiralty pattern anchor, which continued to be used in the navy up to the year 1860. The invention of the steam hammer in 1842 made the welding of heavy masses of iron a comparatively easy and reliable process, so that from this time onward the strength of anchors fully kept pace with that of the chain cables, which had come into general use.

A number of patents for anchors were taken out prior to the great exhibition of 1851, and, public attention having been called to the models there shown, in the following year a committee was appointed by the admiralty to report on the qualifications of anchors of the various kinds. Practical trials were then instituted, and, as a result, Trotman's anchor took the highest place. Rodger's anchor being second on the list. Some of the tests to which the anchors were submitted were of doubtful value, such, for instance, as "facility for sweeping." Nowadays, however, at all events for deep ships in shallow harbors, it is considered an advantage for



Brownhoist Electric Crane with Grab Bucket.

an anchor to offer as little obstruction as possible above the ground.—Science Siftings.

According to advices from Liverpool the depression in the sailing shipping trade is so serious as to have led to a drastic proposal on the part of Liverpool owners for an international combination, whereby a certain proportion of the sailing tonnage of Great Britain, France and Germany should temporarily be laid up, with the view of improving the freight market. Meetings have been held of the German and British owners and the French owners will meet this week to discuss the crisis, which is attributed to the freight cutting tactics of the French, who, in consequence of state subsidies, are enabled to accept lower rates.

Information from Philadelphia is to the effect that the plan of reorganization agreed upon for the Consolidated Lake Superior Co. is a success and that the company will remain intact. An assessment of \$3 is to be made on each share of stock, payable in December, and assurances appear to have been received that the assessment will be met.

WHY DO STAYBOLTS BREAK.

Following are some extracts from a paper read at the convention of foremen boiler makers in Chicago recently by John Livingstone, a mechanical engineer of Montreal, and which was made a part of the proceedings of the convention:

"At this meeting your chairman produced a board to show 171 heads of staybolts from the right side of the fire box on the fireside sheet of a locomotive. At least seventy-five out of the 171 were burned. You have held that the breakage of staybolts is due to expansion and contraction, and unable to counteract the expansion and contraction with the solid staybolt, discussion has centered on flexible staybolts. Too little heed was paid to the lesson taught on the board. Too little consideration was given to the *prima facie* fact that 44 per cent. of the heads of those staybolts were burned. When the bolts begin to burn at the inside of the sheet, the burning continues inward until protected by the water. The heat that causes the burning causes expansion at the inner end and in the hole of the sheet; and that expansion is met by resisting expansion in the sheet (solid against solid), with risk that both the sheet and the bolt will crystallize. The sheet, which may also burn, may crack between the bolts. The bolts will not always break where the force of rigid compression obtains. Sometimes with the concentration of force at one point another part of the bolt snaps under the varying vibrations and strains it has to endure.

"The sheet in ordinary service cannot be burned so long as there is water behind it, for iron has capacity to convey to the water the heat it obtains from the fire, however fierce; but if burning is begun at the inner end of the staybolt it will extend outward and imperil the sheet immediately around it. Though riveted close to the plate the inner end of the bolt is only mechanically in touch with the plate and cannot exercise the functions of the sheet in giving to the water the heat by which it is attacked. The water protects the sheet from burning and the heat passes through the iron to the water. The burning of the inner ends of the staybolts being demonstrated by the burnt ends on the board, it is reasonable to suppose that this argument is correct regarding the flexible staybolt, which offers more substance to burn, and is, neither in the furnace nor at its joints, chemically in touch to exercise the functions of iron to obtain the protection from, and convey the heat to, the water.

"Officials of the Mexican Central system of railways make answer that they have had 30,000 flexible staybolts on trial for four years; that they cost much more than the rigid bolts; that they are unsatisfactory; that they have just as many broken staybolts with the flexible; that they find it difficult to detect the broken staybolts; that they are renewing with solid bolts as fast as locomotives come to the shops for new boxes, and that for ninety engines on order they have specified the rigid staybolt.

This is an answer founded on the test of service and it cannot be combated.

"There is only one way to avert the risk of burning from the inner end of the bolt outward and that is with air through the center of the bolt and the water around it. Nor can you unduly expand a bolt of that character. It will receive the force of the expanding sheet without the resistance of its own power of expansion to the same extent as a solid bolt. The impact of molecules from expansion in the sheet is communicated to the bolt, in which the impact of the molecules from the heat and compression is cushioned in the air passing through the center of the bolt, expanding perhaps three fold between the outer and inner air; this from the heat taken up in passage through the center of the bolt, giving a natural elasticity to the bolt. Given two locomotives stayed with good-quality and equal-sized bolts, the locomotives put into service in the same locality under the same conditions and equally well cared for, the locomotive with the staybolt having the hole through its center will endure in service 20 per cent. longer, steam better, and burn less fuel.

"All solid staybolts are subject to the risks aforesaid. Those more or less crystallized are the cause of the greatest number of breakages. Within the past week I have seen samples of new staybolts made like strands of a rope of iron and steel, rolled seemingly homogeneous, but when threaded and bent, though showing good fiber, the strands or lamination, whichever you choose to call them, were too open to be appreciated by practical men like you. Some people make light of a little crystal. In one of a number of tests which I saw made a speck of crystal about an eighth of an inch in diameter in the sample was cause for a loss of 2,640 lbs. in the tensile strength, as compared with another test of the same sample where there was no crystal. How much greater must be the breakage in staybolts made from iron which shows an excessive amount of crystal, say two-thirds, as seen in a sample on the table at this meeting."

The National Boiler Manufacturers' association at its annual meeting at Chattanooga this week elected the following officers: President, John O'Brien, St. Louis; secretary, J. D. Farsey, Cleveland; treasurer, Joseph Wengler, St. Louis; first vice-president, Robert Monroe, Jr., Pittsburg, Pa.; second vice-president, M. F. Cole, Newman, Ga.; third vice-president, J. F. Casey, Chattanooga, Tenn.; fourth vice-president, Peter J. Hamler, Chicago; fifth vice-president, P. H. Duden, San Francisco.

Low rate for Thanksgiving via the Nickel Plate road for points within 150 miles from place of starting. Tickets on sale Nov. 25 and 26, good to return till Nov. 30, 1903, inclusive. See nearest agent or address E. A. Akers, C. P. & T. A., Cleveland, O. 207, Nov. 30

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English Royal Navy	-	-	-	-	-	-	-	929,300	"
Russian Imperial Navy	-	-	-	-	-	-	-	227,500	"
Japanese Imperial Navy	-	-	-	-	-	-	-	122,700	"
Austrian Imperial Navy	-	-	-	-	-	-	-	56,700	"
Italian Royal Navy	-	-	-	-	-	-	-	13,500	"
Chilian Navy	-	-	-	-	-	-	-	26,500	"
Argentine Navy	-	-	-	-	-	-	-	13,000	"
The "Messageries Maritimes" Company	-	-	-	-	-	-	-	87,600	"
Chemins de fer de l'Ouest: (The French Western Railway Co.)	-	-	-	-	-	-	-	18,500	"
plying between Dieppe and Newhaven	-	-	-	-	-	-	-		
Total Horse Power of Boilers in Use	-	-	-	-	-	-	-	1,850,860	

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NEW OCEAN LANES ACROSS THE PACIFIC.

A Washington dispatch announces that the new cable is likely to change the ocean lanes of the Pacific. Within a few weeks officers of the quartermaster's department of the army will take up this question in reference to the transport service. When the recent American movement to Asia began, Capt. McCalla of the navy conceived the idea of plotting out routes across the Pacific which should be adopted by all the transports and to which the merchant ships should be invited. The object of this plan is twofold. For one thing if an accident befel a ship it could, by being on a beaten track, be picked up by the next vessel that came along. When it is recalled that it is a rare exception in a twenty-six days' journey across the Pacific ocean to sight a solitary ship of any sort, even on this recognized lane, the importance of getting into the range of possible companionship becomes very manifest.

The other advantage to be gained by the use of a uniform course comes in the accumulated knowledge of its peculiarities and dangers. Each ship master keeps a record of the winds and the currents, the temperature of air and water, as well as a constant watch for reefs and rocks on the route. The results of all these findings are made available to every navigator through the publications of the hydrographic office.

Capt. McCalla projected two direct lines to Asia out of San Francisco, one to Manila and the other to Nagasaki. A third route to Asia took the direct line to Honolulu—and "direct" means on the great circle—and from there to Guam or to Manila by a line laid out on the flat surface, or Mercator charts. But the McCalla projections to Asia direct did not prove practicable, and they have been abandoned for reasons growing out of the mysteries of great circle navigation. Any one who applies a string to the surface of a globe representing the earth will readily find that the shortest line between our northwest coast and Japan is one swinging so far north as actually to invade the Aleutian islands. In this way the bulge of the globe is avoided. When a transport now starts out from the Golden Gate on the shortest possible line to Guam, 2,000 miles south of San Francisco's latitude, she sets her prow boldly to the north of west. She makes 140 miles north of San Francisco, all told, in going to Guam on the great circle before her course loses its northerly bearing. It does not begin to dip southward much before the second week of the journey. Thus, to go south, a vessel actually sails north. In southern waters, between Guam and Manila, there is little difference between the great circle route and that on the parallels, because there the parallels are almost great circles. It is toward the north, in every ocean, that the differences are most marked. Capt. McCalla's great circle lanes would have worked well, had all our Philippine business been outward bound. But in bringing back invalids and convalescents from Manila our officers found it perilous to expose them to the cold of the Aleutian island region. With the sick in the hospitals it made little difference, but for those who had progressed toward recovery far enough to insist on remaining out on deck, the change from the sultry climate of Manila proved too sudden. These great circle routes also threw the ships into a region of frequent storms and heavy currents. Accordingly, the acting marine superintendent, Capt. George H. Pierce, decided to plot out some routes of his own, based on a more comprehensive survey of practical conditions. Capt. Pierce began by projecting the great circle between San Francisco and Guam. This is the most southerly of the three Asiatic points which our transports have in view, the other two being Nagasaki and Manila. Guam's great circle route, as already described, does not get far north of San Francisco. This line was accordingly made a main street, as it were, of Pacific navigation, with branches thrown out from a point in mid-ocean to the other two ports. This makes something very like a three-pronged fork as the basis of the Pacific system.

Transports bound for these three Asiatic ports all use the same track for the first half of their journey out of San Francisco. This gives them all the great circle advantage, modified to the extent of avoiding the perils of the far north, with the exception of the Guam route, which is the unmodified direct line. Next in importance to this main street of the Pacific, with its three Asiatic branches, is the route long employed by the commercial liners between Puget sound and Japan. That is also a composite, resulting from such a modification of the great circle as will escape the Aleutian islands. This is a well-established lane. A third is the great circle route between San Francisco and Honolulu, used alike by full-powered steam merchantmen, com-

mercial liners and the transports. These ocean lanes are about 20 miles wide. It would require unusually adverse conditions to drive a Pacific steamer more than ten miles out of the mathematical line which she intended to follow. No attempt has been made, as on the Atlantic, to separate the eastgoing lane from the westgoing. Collisions are not an imminent danger. Transport skippers who have been over the Pacific more times than they can remember say that once in a great while they sight a sailing vessel engaged in the Australian trade beating north to the Midway islands, but, with such an exception, they never expect to see anything twenty-four hours from port in the whole journey. There is, moreover, no lighthouse nor lightship between the Farallon islands, just out of San Francisco, and the San Bernardino Straits, nearly seven thousand miles away. Guam has no lighthouse of any kind. Evidence of human life must be seen on the ship or not at all.

The new Pacific cable has made landings at Hawaii, Midway and Guam islands, which seem set like natural telegraph poles at convenient distances in the Pacific, and all of which belong to the United States. Ocean steamers, by following essentially the same route as the cable, might receive and exchange wireless telegraphic signals at such of those points as they do not touch at. This information could soon be cabled back home, an arrangement of considerable commercial value to the liners, as well as some satisfaction to the friends of officers and soldiers on the government transports. This may be known as the Pacific cable route. An advantage in this route comes from the fact that the ocean current regularly favors vessels going westward from the Hawaiian islands. Although the new route will be 350 miles longer than the one now followed, its adoption by everything westbound is predicted. Eastbound transports will continue to use the present route, taking the Nagasaki prong of the fork, for there they get Japanese coal for the return voyage. Currents, cables and coal are thus the chief factors modifying the actual measurement in the ocean routes of the world.

The tramp, on the Pacific as elsewhere, pursues a course of its own making. Commonly it makes auxiliary use of sail power, directing its course so as to employ to best advantage its combined resources. Other things being equal, it would stick to the ocean lane, but this is rarely feasible. Sailing vessels are still less under restraint, and their number on the Pacific is notably larger than on the Atlantic, on account of the higher price of coal. Although chartered to only a slight extent, the north Pacific is well adapted for free-lance navigation. Its depths are so tremendous as to make rocks, shallows and shoals of exceedingly rare occurrence. The depth of most of the ocean between San Francisco and Guam is from 3 to 5 miles. This is over the great plateau of the ocean bed. Between San Francisco and Honolulu there is even more of a depression, while a little west of Guam soundings only a few feet less than six statute miles have been made. It was such depths that for a long time deterred the cable layers.

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TRADE NOTES.

An order was received a few days ago by the Atlantic Works Incorporated of Philadelphia from the Eastern Ship Building Co. of New London, Conn., for one of their 10-in. electric deck planing machines.

Capacity of the works of the Falls Hollow Staybolt Co. at Cuyahoga Falls, O., for the manufacture of the double-refined charcoal-iron hollow and solid staybolt material, that is so well known to manufacturers of marine and locomotive boilers, has been doubled of late. An addition of 50 by 200 ft. which was recently made to the works of this company greatly increases the storage capacity for raw and manufactured products.

A centrifugal pump of novel design and unprecedented capabilities will be exhibited at the St. Louis exposition by Henry R. Worthington of New York city. That this pump marks a distinct departure from the usual centrifugal practice will be appreciated when it is stated that it will be capable of delivering about 500 gallons of water per minute against a head of 250 lbs. per square inch, and with high efficiency. This pump is of the type known as the multi-stage, turbine centrifugal, and differs in a great many respects from the centrifugal pumps with which engineers have been familiar.

The Rippley Hardware Co. of Grafton, Ill., is attaining a favorable and widespread reputation as manufacturers of metal life boats, skiffs and yacht hulls. They have one of the best lines of metal boats on the market. Grafton is 40 miles north of St. Louis at the mouth of the Illinois river and is one of the best sites on the Mississippi for a boat yard. Shipments can be made by rail or river. With a view to filling orders promptly, an addition 30 by 90 ft. and three stories high is being made to the factory at this yard and new machinery is being installed. This company's principal output is in steel boats fitted with air chambers and made to come up to government specifications, but they also have quite a trade in yacht hulls. They shipped one yacht up the Ohio river and one down the Tennessee within the

past thirty days and have six more to build. Among concerns from whom orders have recently been received or to whom shipments have been made are the Eagle Packet Co. of St. Louis, Gerdes & Co. of New Orleans, Cairo City Coal Co. of Cairo, Eagle Boat Stove Co. of St. Louis, Consolidated Coal & Coke Co. of Pittsburgh, St. Louis Transit Co. of St. Louis and Havana Metal Wheel Co. of Havana, Ill.

NOT R. L. NEWMAN.

Editor Marine Review: Having noticed in recent issues of the New York papers that a Mr. Newman was in June, 1902, elected "dummy" president of the "United States Ship Building Trust," and knowing no other Newman a ship builder, I beg to state that the Newman referred to is not R. L. Newman, late general manager of the Globe Iron Works, Cleveland, and general superintendent of the New York Ship Building Co., Camden, and now consulting engineer and naval architect in New York. He has in no way been connected with the "trust."

R. L. NEWMAN.

The Marconi, New York, Nov. 4, 1903.

The Quebec Steamship Co., Ltd., has entered into contract with James Laing & Sons, Sunderland, for a 5,000-ton twin-screw steel steamer of 16 knots sustained speed for the Bermuda line. The vessel will have cold storage capacity for the carriage of green vegetables from Bermuda and meats from New York.

Duck and quail hunters—Half-fare rates to parties of three or more traveling together on one ticket via Nickel Plate road to McComb and Payne, O., and points between those stations; also to South Whitley and Will Vale, Ind., and intermediate points. Tickets on sale Nov. 9 to 30, inclusive, good to return till Dec. 3, 1903. See nearest agent or address E. A. Akers, C. P. & T. A., Cleveland, O. 201, Nov. 30

For Sale.

Tug Duncan City. Address, Geo. Pankrantz Lumber Co., Sturgeon Bay, Wis. tf

Marine Boilers for Sale.

For Sale—A number of various styles of marine boilers in good repair. For further particulars apply to Howard S. Folger, Kingston, Ont. tf

Galveston, Texas, Oct. 7, 1903.

Sealed proposals, in duplicate, for grade raising at Galveston, Texas, involving over 11,000,000 cubic yards of filling, will be received by the Chairman of the Grade Raising Board, until 2 P. M., Dec. 7, 1903, and then publicly opened. For information apply to E. R. Cheesborough, Secretary Grade Raising Board, Galveston, Texas.

Dec. 8 C. S. RICHE, Consulting Engineer.

Dredging Plants for Sale.

For Sale.—Two dredging plants complete, consisting of two dredges, tugs Maytham and Duncan Robertson; also five dump scows and two flats, with sundry duplicate parts of machinery, etc.; also extra spud anchors and dipper teeth, etc.; all having been kept up in good working condition and comparatively new, and could be delivered at once on satisfactory sale. For further information as to capacity and prices of each plant inquire of James Pryor, Houghton, Mich. Nov. 12

Steamer and Tow Barge for Sale.

Lake steamer and tow for sale. Total tonnage 1,000. Equipment complete. A-1 condition. Address, G. M., care Marine Review Pub. Co., 39-41 Wade Bldg., Cleveland, O. Nov. 12

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TIMBERS, PLANK
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F. S. SHURICK,

18 Broadway, NEW YORK CITY

Gasoline Engine for Sale.

For Sale Cheap—One 16-H. P. Superior gasoline engine. Used less than three months. Address Alpern & Co., Alpena, Mich. Nov. 12

Tug for Sale.

Tug Warwick—Engine 15x17. Boiler allowed 110 lbs. steam. Both in first-condition. Hull practically new. Boat inspected and ready to run. Cheap for cash. Can be seen at Toledo, O. Apply to James Rooney, 1118 Collingwood ave., Toledo, O. tf

Small Steam Barge for Sale.

I have for sale a small steam barge. Carries 250 tons. Address, Capt. F. E. Wood, Alexandria Bay, N. Y. tf

Yacht for Sale.

New beautiful 100-ft. steam yacht, fully equipped. Owner physically unable to use yacht. Will sell for any reasonable offer. Yacht can be seen in Detroit. Address M. J. STEFFENS, 57 East Twenty-second st., Chicago. tf

Wanted.

Ship yard rolls to take in 20 feet length. Wire price and particulars to

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Upper works to suit.

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Nov. 12

Engine for Sale.

For Sale.—Fore and aft compound engine, 27 and 50x40 in. Has been entirely overhauled and is as good as new. High pressure cylinder can be reduced if desired. Engine is now at shops of Montague Iron Works, Montague, Mich. For further particulars address the Montague Iron Works. Nov. 12

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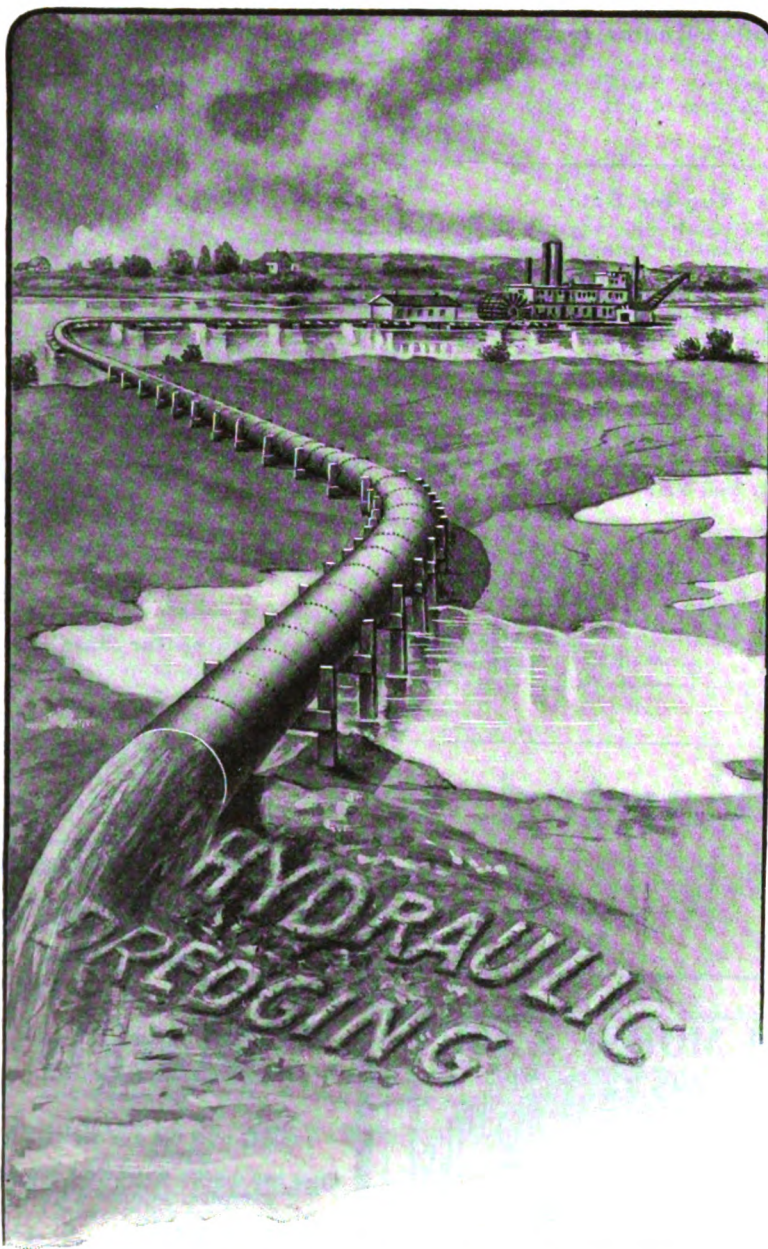
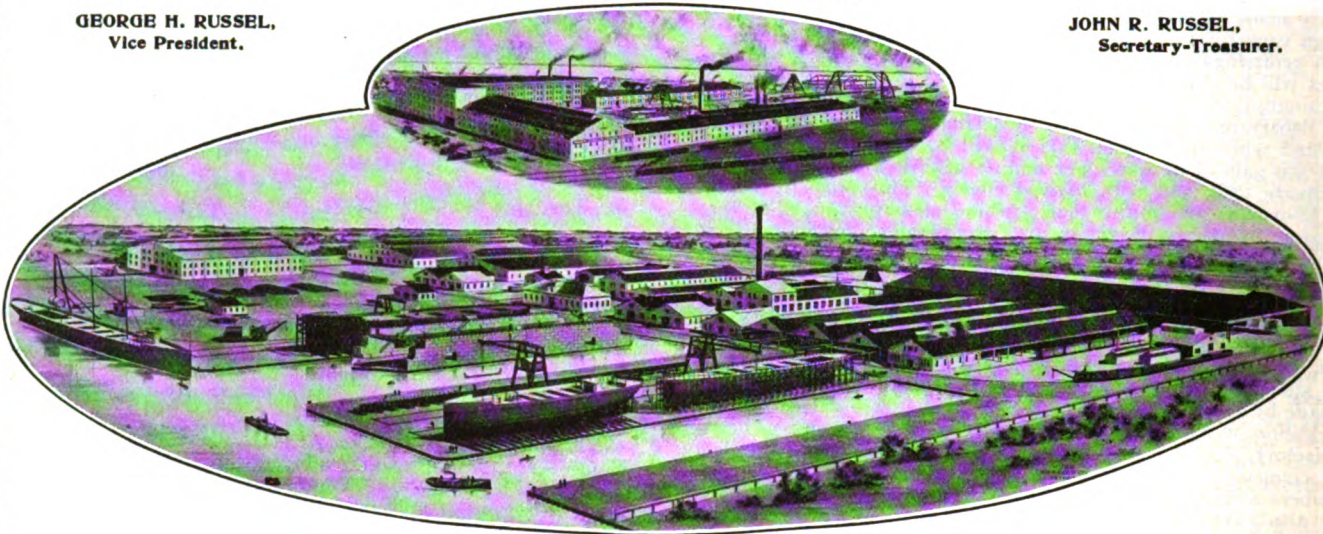
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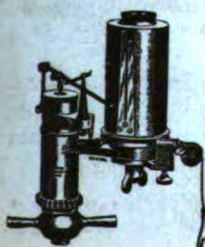
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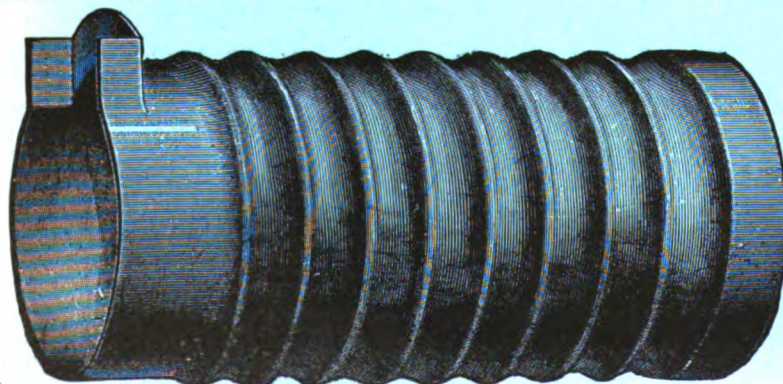
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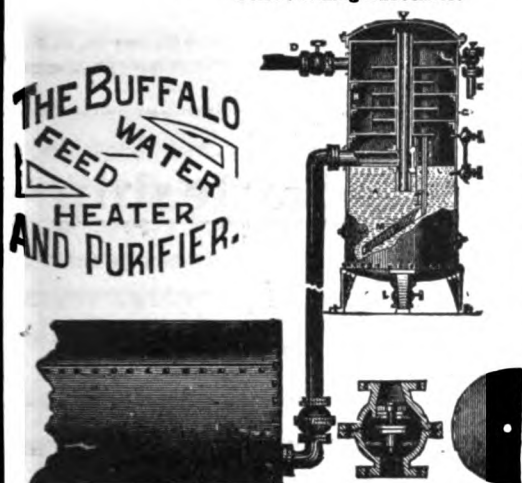
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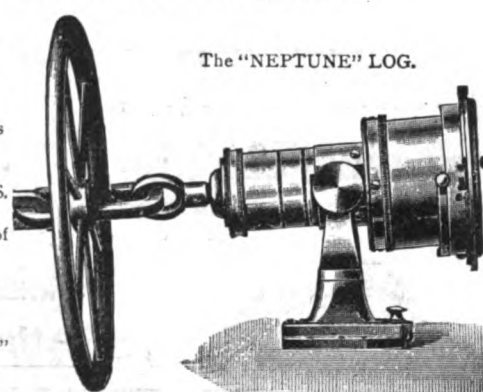
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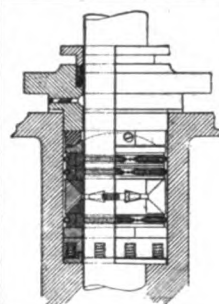
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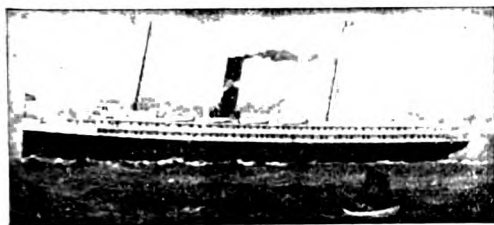
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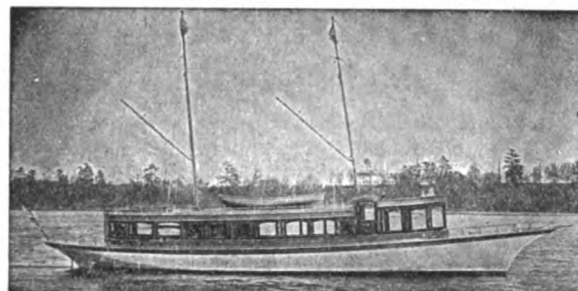
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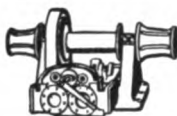
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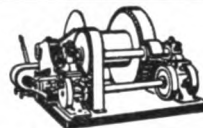
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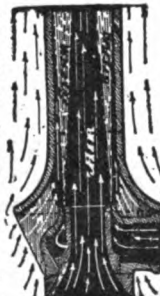
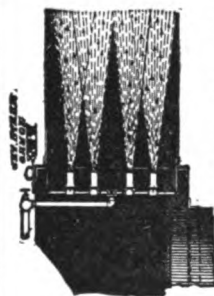
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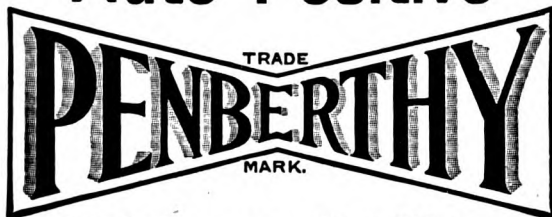
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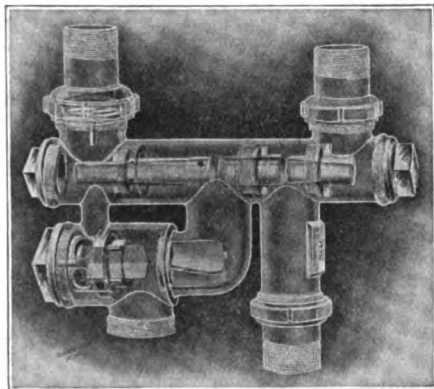
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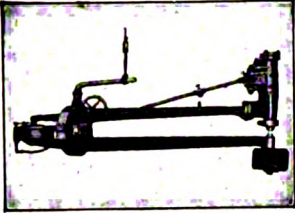
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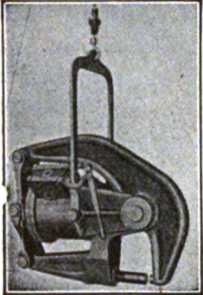


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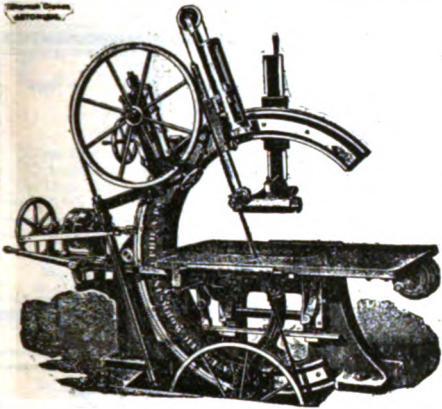
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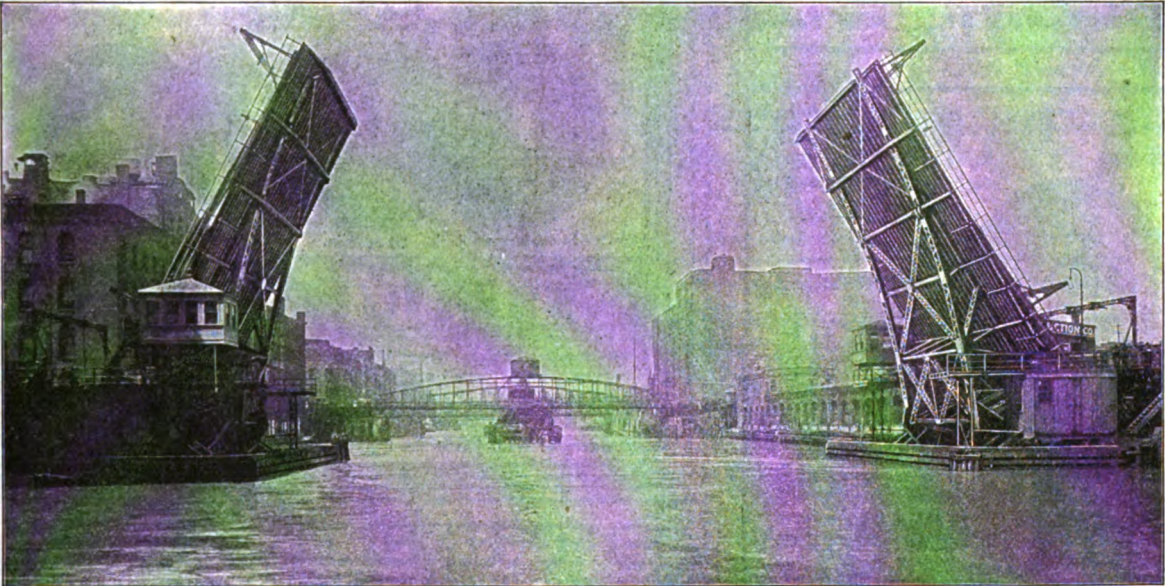
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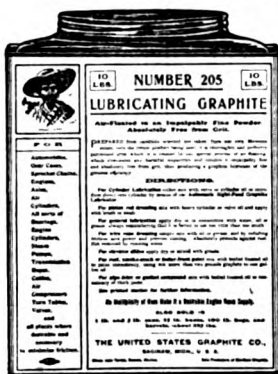
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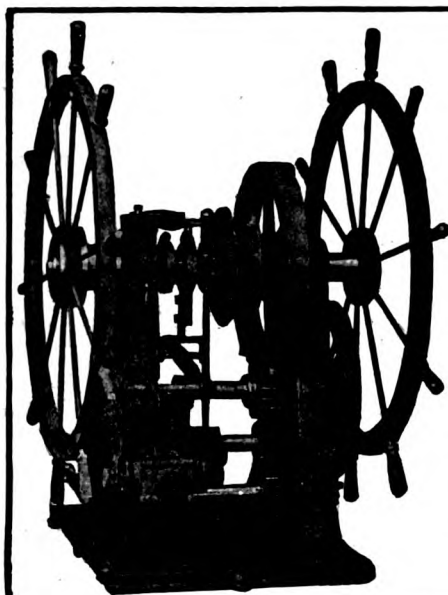
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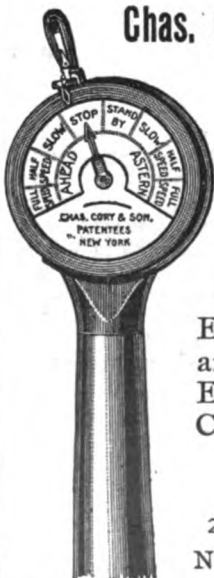
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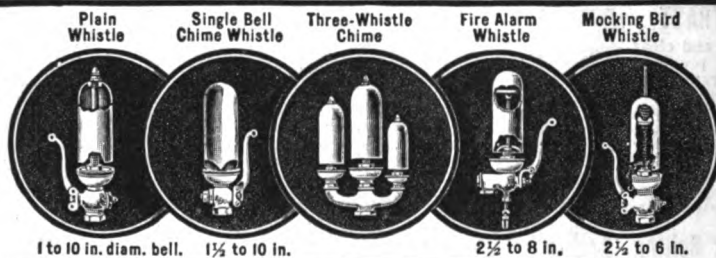
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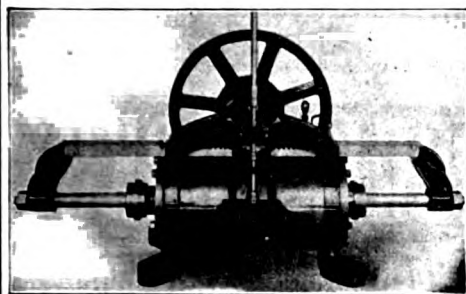
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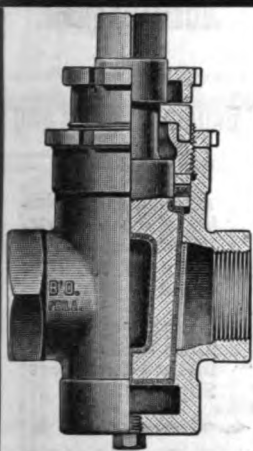
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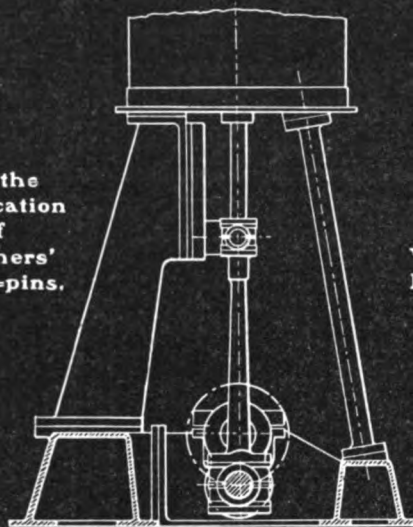
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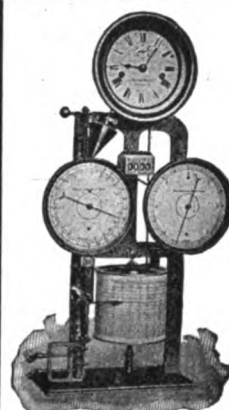
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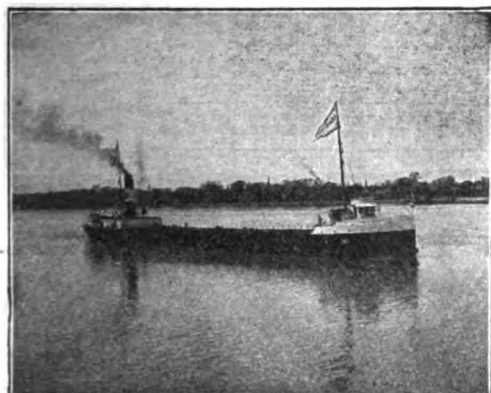
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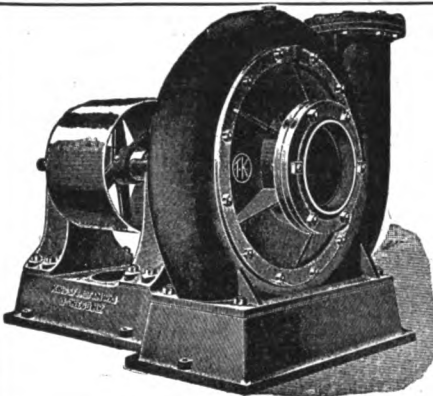
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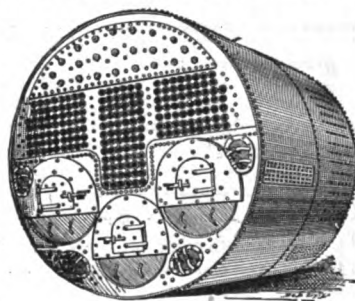
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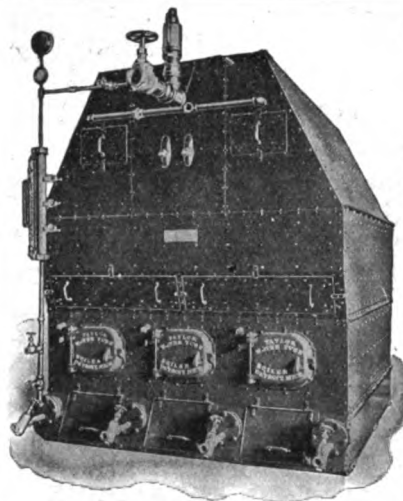
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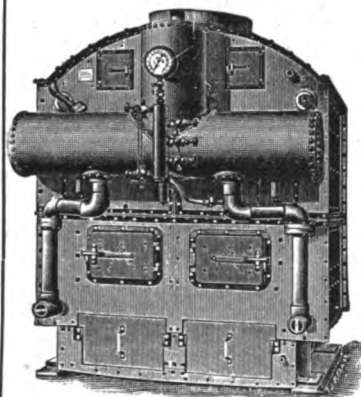
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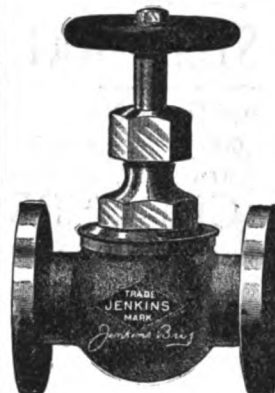
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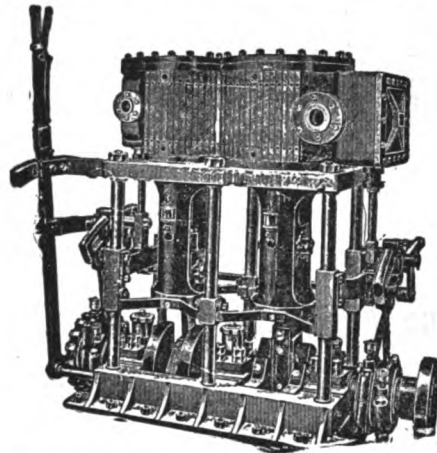
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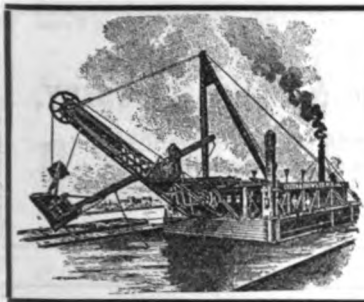
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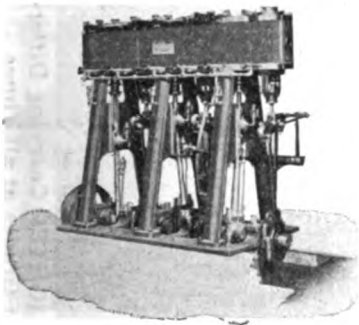
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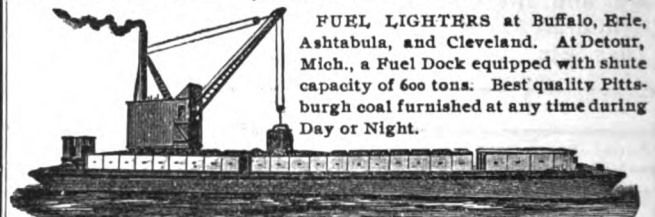
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Poe Lock, from below, open.
Poe Lock, from above.
Poe Lock, with Whaleback.
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Weltzel Lock, from below.
Str. North Land Passing Locks, two views.
Upper Entrance to Lock Canal.
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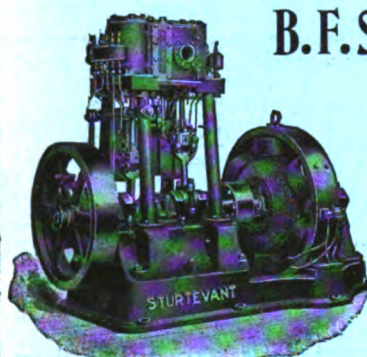
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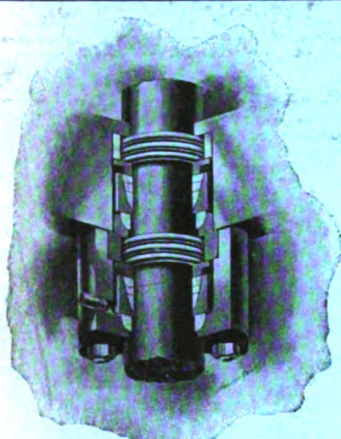
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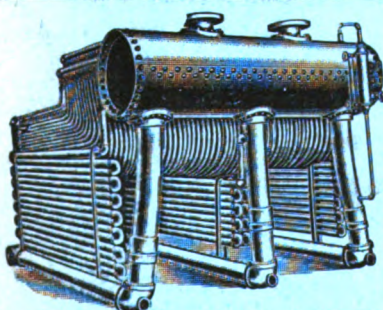
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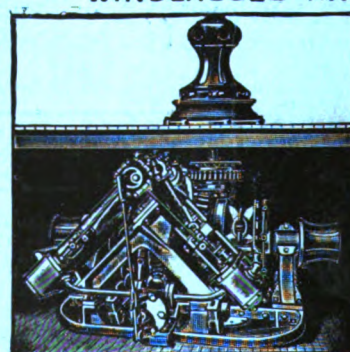
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